THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES.

OCTOBER, 1893.

A STUDY OF ADDISON'S DISEASE AND OF THE ADRENALS.[1]

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Since the description was published by Addison, in 1855, of the disease which bears his name, much study has been expended upon the etiology of this remarkable affection. The present research has been undertaken with the view of formulating such conclusions in regard to the etiology and symptomatology of Addison's disease as our still limited knowledge of the subject justifies. My personal experience includes three cases with autopsies, and to these are added three more, which are all that careful search discovered among the statistics for the past ten years of the New York and Presbyterian Hospitals. In addition, I have collected unreported records of 40 autopsies in which lesions of the adrenals have been noted, but without accompanying symptoms of Addison's disease.

In two exhaustive articles by Lewin (*Charité Annalen*, 1885, p. 630; 1892, p. 536), all cases of Addison's disease and of diseases of the adrenals which were reported prior to the latter part of 1891 were tabulated, to the number of 684. I have brought this work up to date, analyzing 73 more histories. This total of 757 cases recorded by many different observers constitutes a series large enough to afford definite data, since autopsies were made in nearly all.

The term "Addison's disease" strictly applies to an affection which, as described by Addison himself (*Dr. Addison's Works*, New Sydenham

[1] Read before the Association of American Physicians at Washington, May 30, 1893.

Soc., 1868, p. 211), includes, among less characteristic features, extensive bronzing of the skin; but since in many instances the pigmentation is absent, while the other symptoms are decided, and are accompanied by the lesions common to the typical form, conclusions will be drawn from both classes.

The six new cases are here annexed. All were characterized by very decided bronzing of the surface of the entire body, which in one instance only was accentuated here and there by oval spots of a blacker hue. In addition, all the patients presented a group of definite symptoms, viz., great muscular weakness and prostration, indistinct heart-sounds, feeble pulse, pronounced gastric irritation with repeated attacks of nausea and of almost uncontrollable vomiting, mental apathy, and local pain.

In three of the cases in which autopsies were obtained, both adrenals were found softened and degenerated to a degree which entirely obliterated their original structure.

The first of the cases which came under my care was so unusual that it deserves special mention.

CASES OF ADDISON'S DISEASE PREVIOUSLY UNREPORTED.

CASE I.—The patient, J. A., was an intelligent Irishman, fifty years of age. He was admitted to the Presbyterian Hospital on May 5, 1891. He contracted syphilis several years before, and also suffered from frequent severe attacks of malarial fever during a three years' residence in Central America. Eight months before admission he noticed discoloration of the skin, general muscular weakness, and indigestion, especially of fatty food. He also had more or less diarrhœa, and for two months he suffered greatly from nausea and vomiting. On three occasions he was seized with sudden faintness, accompanied by severe pain in the right hypochondriac region. Five months before admission his skin began to darken and became more and more bronzed. The color appeared first upon the face and later upon the trunk and extremities. The intensity of the discoloration varied from time to time, but on the whole progressed quite rapidly.

On admission the chief complaint was of general muscular weakness. Physical examination of the lungs and abdominal viscera revealed nothing abnormal. Heart-sounds extremely feeble, pulse feeble, soft, compressible, 72. Respiration and temperature normal. Urine normal. Red blood-cells 1,922,000 per cubic millimetre. Body ill-nourished, but not emaciated. The face and hands were of a dull mahogany-brown color, the rest of the integument of a lighter brown.

After several days of rest and tonic treatment the patient gained in strength and was allowed to go out for exercise. After some hours he returned very hungry, and said that he had been evicted from three restaurants where he applied for lunch, on the ground that he appeared to be a negro, which indeed he resembled. After this experience he remained in the hospital, and became progressively weaker and mentally dull, with a rapid and extremely feeble pulse. He also had another seizure of pain in the right hypochondrium, which was very intense and

followed an evacuation of the bowels. The visible mucous membranes became pigmented.

The man suddenly developed pneumonia and died on the thirteenth day.

The *autopsy* showed both the adrenals to be normal. The liver exhibited syphilitic cirrhosis. The splenic capsule was thickened and adherent, and the spleen itself was soft. There was some thickening of the duodenal mucous membrane. Pneumonia was present at the base of the right lung. Nothing else of importance was observed.

CASE II.—S. H., male, thirty years old, German. Admitted to Presbyterian Hospital. No history of alcoholism or of syphilitic infection. Excepting several attacks of malarial fever, general health good until two years ago, since which time there have been frequent attacks of nausea and vomiting, with severe headache and anorexia. For the few weeks prior to admission, great languor and muscular weakness with increasing gastric distress and vomiting were present. Patient vomited constantly for three days, and complained of fever and sore-throat.

Examination on admission. Anæmia decided, emaciation extreme. The entire surface of the body, and especially the skin over the chest, scrotum, and thighs, is of a dusky brown color. The hue presents a uniform gradation from that of a light mulatto on the chest to that of a dark negro in the above situations. No isolated patches of pigment, no icterus, conjunctivæ normal, no discoloration of the buccal mucous membrane. Acute catarrhal tonsillitis is present. The heart-sounds are feeble, and a pulmonic anæmic bruit is heard. The free border of the liver extends to the umbilical line. Spleen moderately enlarged. Urine contains albumin with hyaline and granular casts. Temperature 100°. Pulse 92.

The patient continued to vomit, the heart action failed, pulmonary œdema ensued, and delirium was succeeded by drowsiness, coma, and death. The urine was retained for twenty hours before death, and the final temperature reached 105°.

Autopsy. Heart-muscle soft, valves normal. Lungs normal. Liver enlarged, cirrhotic, mottled with hemorrhagic spots. Kidneys in condition of acute parenchymatous nephritis. Adrenals: both enlarged and completely degenerated, filled with caseous débris, no gland-structures remaining. Semilunar plexus and adjacent sympathetic nerves appear normal. Spleen double the normal size, dark, soft, pultaceous.

CASE III.—H. W., male, forty-four years old, Englishman, waiter. Admitted to the Presbyterian Hospital. Previous history of moderate drinking, attacks of malarial fever, rheumatism, and syphilis. Since having rheumatism, four years ago, the patient has had occasional œdema of the lower extremities and moderate dyspnœa upon exertion. Nine weeks previous to admission he began to suffer from anorexia, nausea, and vomiting, and lost strength and flesh. One week before admission he was seized with severe pain at the base and left side of the chest, which was followed by a chill the next day. He also complained of a painful dry cough.

Examination on admission. General nutrition good. Entire surface of body moderately pigmented; darkest on hands, face, and genitalia. Hue that of a light mulatto. No patches of pigment. No pigmentation of visible mucous membranes. Pulse very feeble, 100. No cardiac bruit. Temperature 101°. Dry pleurisy at base of left side of chest. Liver-dulness diminished in area. Splenic dulness increased. Urine normal.

On the third day effusion appeared in the left pleural sac, the heart action becoming extremely feeble, and uncontrollable nausea with vomiting and distressing singultus ensued. Both stomach and rectum rejected all food. On the eighth day a general convulsion and pulmonary œdema occurred, and the patient died in coma.

Autopsy. Besides the fluid in the left pleural sac, large lipomatous growths were found projecting from the pleural surface of the diaphragm on the left side, in masses resembling a cock's comb, which were 1½ to 2 inches long, and could be readily stripped off. Lungs œdematous, otherwise normal. Heart covered by a large layer of fat, valves normal, walls very soft. Liver small and slightly cirrhotic. Spleen enlarged by one-half and deeply pigmented. Kidneys surrounded by fat. They show early stage of chronic diffuse nephritis. Adrenals: each as large as a hen's egg, cortex completely caseous, medulla somewhat softer, but without pus. Not a trace of original structure remaining. Both surrounded by large accumulations of fat. No abnormality of semilunar ganglia observed.

Case IV.—S. M. H., female, fifty-seven years old. Twenty months before her death, while in apparent good health, patient observed dark brown spots which first appeared on the neck, then on thighs and hands. Since then bronzing has become diffuse, and the patient has had occasional attacks of anorexia, nausea, vomiting, and prostration. She was twice admitted to the New York Hospital, with a year's interval. The first time that she entered the hospital her symptoms were mainly nausea, vomiting, epistaxis, insomnia, and muscular weakness, with moderate bronzing. After a few days the patient was discharged improved. Five weeks before admission for the second time, patient had severe vomiting, headache, constant pain in left hypochondrium, followed by rapid loss of flesh and strength. Has at times passed almost no urine, at other times has had moderate polyuria. Frequent epistaxis occurred.

On admission the integument was found deeply bronzed over the entire body, but especially so where exposed to the air. Conjunctivæ not pigmented, but lips and buccal mucous membrane spotted with dark gray patches. Anæmia was observed with marked asthenia, mental hebetude and despondency, and the pulse was weak, small and compressible. The patient died quite suddenly the same day of asthenia.

Autopsy. Body fairly nourished, rigor mortis well marked. Entire body distinctly bronzed with the exception of an old cicatrix one and a half inches in diameter in centre of forehead. Peritoneum, showing adhesions between liver and other viscera, and about the spleen. Heart brown, size normal, valves normal. Lungs, spleen, stomach, and intestines all normal. Liver small, cirrhotic, and pigmented. Brain and its membranes normal. Kidneys small, with adherent capsules and a few superficial cysts; cortex thin and markings indistinct. Adrenals: normal in size but irregular in thickness and nodular; cortex and medulla not distinguishable, studded with small caseous masses. Microscopic examination shows many small caseous areas surrounded by masses of young cells, with numerous giant-cells among them. No trace of original structure of medulla or cortex.

(The two following histories are incomplete in that they are without autopsies, but they illustrate the correlation of the symptoms of asthenia, pigmentation, vomiting, feeble pulse, etc.)

CASE V.—J. P., male, twenty-two years old, waiter, Englishman. Ill but two weeks with great muscular weakness with mental apathy. On admission to the New York Hospital the patient's condition was as follows: General nutrition good; no visceral lesion discoverable on physical examination, but the urine contains granular and hyaline casts. Blood examined and found normal. There was decided bronzing of a large surface of the body, especially over the chest and abdomen. The nipples were quite black. The patient appeared in a condition of melancholia, obeying when directed, but refusing to speak, and he would not voluntarily move or change his expression. Emaciation soon followed and became extreme.

After six weeks of treatment the mental condition failed to improve, and the patient was transferred to another institution.

(For the privilege of abstracting the two previous histories I am indebted to Dr. Peabody, in whose hospital service they occurred.)

CASE VI.—E. T., female, forty-six years old, laundress, Irish. History of occasional attacks of rheumatism and malarial fever. For sixteen months prior to admission to the New York Hospital, following exposure to cold and wet, the patient had occasional attacks of intense pain in the backs and hips, vertigo, headache, and severe vomiting. On admission, complained of shortness of breath, nausea, vomiting, and asthenia. Patient has noticed great variations in the quantity of urine at various times. Bowels constipated. For a year patient's skin has been growing uniformly dark, with brown spots on hands and body. Physical examination failed to reveal any visceral lesion. General nutrition good. Heart sounds very feeble, but without bruit; pulse 98, weak. Entire surface of body dark brown, inclining to black in certain regions. On the hands, feet, and body there were a few oval spots of darker hue than the surrounding skin. After some days of treatment the patient was discharged somewhat improved.

LESIONS OF THE ADRENALS.

Disease of the adrenals occurring as the sole lesion observed of any importance is recorded in nearly one-half of all cases, while in a further large number it accompanies, or is secondary to lesions elsewhere. But we are obliged to abandon the earlier theory that Addison's disease is etiologically dependent upon adrenal lesion, in view of the fact that many typical cases have lately been observed, such as one just cited (Case I.), with well-marked bronzing, in which the adrenal bodies were entirely normal. Among Lewin's histories 12 per cent. were of this type. Virchow describes a typical case with pigmentation, in which the microscopic examination of both the adrenals and sympathetic system presented nothing abnormal. Moreover, it is well established that every variety of adrenal lesion which has ever been found associated with Addison's disease has also occurred without giving rise to any symptoms whatever.

A most instructive case is related by Jürgens, where the pressure of a large aneurism caused atrophy and degeneration of the left splanchnic

nerve with typical bronzing and other symptoms of Addison's disease, whereas the adrenals remained entirely normal.

In addition to the 40 cases of adrenal lesions which I have collected from hospital records, the existence of which gave rise to no symptoms of Addison's disease, are 72 others recently reported, making in all 112. Such cases must be common in the experience of anyone who is especially looking for them. The 40 unpublished notes are as follows:

CASES OF LESIONS OF THE ADRENALS ACCOMPANIED BY NO BRONZING OR ANY OTHER SYMPTOMS OF ADDISON'S DISEASE.

A. *Lesions other than simple fatty infiltration.*

CASE I.—Pleurisy, with effusion; hydro-peritoneum. Liver mottled and congested. Left kidney slightly enlarged, pale, with thickened cortex. Adrenals: normal in size, but cortex strongly pigmented (yellow).

CASE II.—Acute pleurisy, with effusion and ulcerative endocarditis. Liver infiltrated with fat; stomach mucous membrane dotted all over with a large number of petechial spots; kidneys showing diffuse nephritis. Adrenals: softened at centre, normal in size.

CASE III.—Cardiac valvular lesions and fibrinous pleurisy. Liver cirrhotic; capsule adherent to diaphragm. Kidneys: right waxy, left very large, filled with abscess cavity; left ureter obliterated and converted into dense connective tissues. Adrenals: both enlarged, with areas of yellow softening in medulla, cortex thickened and yellow in patches.

CASE IV.—Incarcerated hernia; gangrene of thigh. Adrenals: both enlarged and the seat of numerous hemorrhages and spots of softening.

CASE V.—Pernicious anæmia. Adrenals: both enlarged and cystic.

CASE VI.—Pulmonary embolism; large carcinoma of right supra-renal (left normal). No pigmentation of skin.

CASE VII.—Carcinoma of stomach. Hemorrhage in right supra-renal capsule.

CASE VIII.—Interstitial nephritis. Supra-renals much atrophied.

CASE IX.—Chronic diffuse nephritis. Adrenals: both cortices fatty. Interior of right completely degenerated.

CASE X.—Lobar pneumonia; chronic diffuse nephritis. Adrenals: both cortices fatty; right also cystic.

CASE XI.—Tubercular osteitis. Acute general miliary tuberculosis. Adrenals: both markedly increased in size, and containing many small grayish degenerated tubercular nodules.

For the notes of Cases IV. to XI. and for most of the cases of fatty adrenals cited below, I am indebted to Dr. Farquhar Ferguson, Pathologist to the New York Hospital, and to his assistant, Dr. George P. Biggs.

The reports of cases XII. to XXV. have been kindly given me by Dr. John S. Thacher, with whose permission I present the following notes: He says: "I have gone over the records of my autopsies at the Presbyterian Hospital, St. Luke's Hospital, and the State Emigrant Hospital. There are 971 of these in which the abdominal organs were examined. In most of them the condition of the adrenals was observed, and in the

majority (575) it is found noted. In only 15 is it recorded as abnormal, certain variations in size, color, and consistence which are commonly met with not being classed as abnormal."

[One of these cases was genuine Addison's disease, and is referred to elsewhere; the remaining 14 are as follows:]

CASE XII.—April 12, 1889. Pulmonary tuberculosis, pneumothorax. Left adrenal contains a yellow nodule moderately firm. Right adrenal the same, but contains nodule three-quarter inch in diameter.

CASE XIII.—February 15, 1890. Tuberculosis of genito-urinary tract, lungs, intestines, cerebellum, cord, and adrenal. Left adrenal almost entirely replaced by a cheesy mass. Right adrenal normal.

CASE XIV.—July 13, 1890. Cancer of cardiac end of stomach; cancer of mesenteric and retro-peritoneal glands and liver; chylous ascites. Left adrenal contains white carcinomatous nodules.

CASE XV.—January 30, 1891. Fractured ribs; hemorrhage into pleura; acute pleurisy; hemorrhage into spleen; complete fracture of ulna. Left adrenal contains a nodule about one-third inch in diameter, rather soft in consistence, pinkish-yellow in color. Right adrenal contains a nodule like the other, but flattened, grayish in color, separating readily from the rest of the organ. Microscopic examination: cells fatty.

CASE XVI.—April 3, 1891. Chronic cystitis; chronic pyelo-nephritis. Right adrenal firm; on section found to contain a few pea-sized, firm, yellow masses. Left adrenal contains nodules like the right. Microscopic examination: typical tubercular inflammation.

CASE XVII.—February 8, 1892. Grippe; facial erysipelas; pneumonia. Left adrenal extremely thin, gray, of normal consistence; right adrenal the same. Microscopic examination: many leucocytes in spots; new connective tissue in some parts. The adrenal cells are some of them proliferated, some of them degenerated.

CASE XVIII.—April 2, 1892. Cancer of œsophagus; gangrene of lungs; gastrotomy. Left adrenal contains a nodule one-half inch in diameter. Right adrenal contains a similar nodule one inch in diameter. Microscopic examination: carcinoma, typical.

CASE XIX.—May 5, 1892. Chronic pulmonary phthisis. Left adrenal normal, except a pea-sized, yellow, caseous nodule.

CASE XX.—September 2, 1891. Tubercular ulcers of intestines; perforation; peritonitis. Left adrenal, one end enlarged; on section shows a grayish, moderately firm mass three-quarters inch in diameter. Right adrenal the same. Microscopic examination: section consists almost wholly of small cells, little larger than leucocytes, mostly not round, but pea-shaped and irregular, no alveoli; looks like sarcoma.

CASE XXI.—January 25, 1893. Chronic tuberculosis of hip-joint; waxy degeneration of liver, spleen, and kidneys; broncho-pneumonia; acute pleurisy. Left adrenal appears normal. Microscopic examination: typical tuberculosis.

CASE XXII.—October, 1889. Cancer of lungs, heart, liver, kidneys, and adrenals. Latter contain small nodules one-quarter inch in diameter.

CASE XXIII.—February 17, 1892. Paris-green poisoning; acute gastro-enteritis. Right adrenal contains a yellowish nodule about one-half inch in diameter, a little softer than the rest of the organ. Left adrenal normal. Microscopic examination: mass of adrenal cells in

rather irregular alveoli, most of them in a state of marked fatty degeneration; a little infiltration of leucocytes at the periphery.

Case XXIV.—March 26, 1892. Chronic nephritis; cirrhosis of liver; cardiac hypertrophy and dilatation. Right adrenal is replaced by a mass about twice the size of the normal organ, gray and granular. Left adrenal normal. Microscopic examination: typical tubercular inflammation.

Case XXV.—April 21, 1893. Chronic cystitis; abscess of seminal vesicle; external urethrotomy; pyelo-nephritis; miliary tuberculosis of lungs. Both adrenals contain cheesy nodules. Microscopic examination: cheesy spots surrounded by infiltration of small cells and epithelioid cells; probably tubercular.

"I recall also two cases of diseased adrenal, not contained in the records mentioned. One was an employé at the State Emigrant Hospital, who slowly and gradually became anæmic and asthenic, but no cause could be detected. His color was very white. After autopsy the adrenals were found cheesy.

"The other was a patient in the Colored Hospital. I can only recollect that at the autopsy the adrenals were cheesy and the tongue showed brown patches, and it was concluded that he had died from Addison's disease." (Thacher.)

The following case (XXVI.), as well as Case XL., was kindly examined for me by Dr. Warren Coleman, Instructor in Pathology, Loomis Laboratory, New York:

Case XXVI.—Catarrhal pneumonia; cheesy foci in lungs; cardiac hypertrophy and dilatation; kidneys hard, congested, surface rough, cortex diminished. Adrenals: right normal; lower portion of left degenerated and converted into a white homogeneous substance. Microscopic examination shows the cells not filled with fat but with scanty protoplasm, leaving the nuclei intact in the centre of a reticulum. No necrotic areas; no congestion. Only a few normal cells are found, chiefly in the zona glomerulosa.

Semilunar ganglia (of both sides): The nerve-cells are distributed unequally throughout the ganglia. In many instances a definite sheath can be made out around them. Nerve bundles run through the ganglia at different points. Between the cells there is connective tissue with long oval nuclei resembling the nuclei of involuntary muscle. The tissue is most abundant where the cells are fewest. The nuclei are normal in shape. Nucleoli prominent. Many of the cells are pigmented with small golden-brown granules scattered through the protoplasm. They resemble hematoidin granules.

B. *Fatty changes.*

Case XXVII.—Cirrhosis of liver. Adrenals both contain considerable fat in the cortices, more abundant in the left than in the right.

Case XXVIII.—Croupous pneumonia. Adrenals both very fatty.

Case XXIX.—Lobar pneumonia. Adrenals both contain fat in the cortices.

Case XXX.—Cirrhosis of liver; pulmonary tuberculosis; chronic diffuse nephritis. Adrenals both contain much fat in the cortices.

Case XXXI.—Lobar pneumonia. Right supra-renal body normal. Left contains much fat.

Case XXXII.—Ulcerative endocarditis; aortic insufficiency. Adrenals: both cortices fatty.

Case XXXIII.—Lobar pneumonia. Adrenals: both cortices fatty.

Case XXXIV.—Lobar pneumonia (bilateral). Adrenals both contain considerable fat.

Case XXXV.—Aneurism of thoracic aorta; pneumonia; chronic diffuse nephritis. Adrenals both very fatty, the fat irregularly distributed throughout the cortex in patches of various sizes.

Case XXXVI.—Chronic diffuse nephritis; entero-colitis. Adrenals both very fatty.

Case XXXVII.—Myocarditis; diffuse parenchymatous nephritis. Adrenals both contain a great deal of fat diffused throughout their entire cortices.

Case XXXVIII.—Aneurism of thoracic aorta; lobar pneumonia. Adrenals both very thick, and contain much fat in cortices.

Case XXXIX.—Pyo-pneumothorax; pulmonary tuberculosis. Adrenals both very fatty.

Case XL.—Dilatation of aorta; cardiac hypertrophy; miliary tubercles in lungs; kidneys small, capsule adherent, markings indistinct. Adrenals—microscopic examination: majority of cells in zona fasciculata contain small fat globules of various sizes, or one large globule displacing the nucleus. Some of these cells are distended. Other cells have lost their nuclei and are granular and necrotic. Portion of medulla next to cortex normal, except for congestion, which is evident throughout the section.

The entire list of 112 cases, without symptoms of Addison's disease, includes: Extensive pigmentation; cloudy swelling from cases of infection from pathogenic organisms (*Brit. Med. Journ.*, May, 1889); atrophy, infiltration with small, round cells; fatty infiltration; tubercular inflammation (with bacilli); several simple cysts; two cases of hemorrhagic cyst; one of gumma; and a number of adenoma, sarcoma, and carcinoma.

Twice the supra-renal bodies have both been congenitally absent (Martini, *Comptes rendus*, 1856, xliii. p. 1053; Spender, *Brit. Med. Journ.*, September 11, 1858); and four times either the right or left has existed alone. Dr. Hartley recently told me that he has removed a supra-renal capsule in connection with excision of the kidney without the subsequent occurrence of any noteworthy symptoms.

In view of the opposing facts, the immediate causative relation of supra-renal lesions to the symptoms of Addison's disease cannot be easily maintained, in spite of their frequent coincidence, and we must seek a further explanation in the relation between the adrenals and the sympathetic nervous system. To this subject it will be convenient to return.

ADRENAL TUBERCULOSIS.

Two facts must be admitted regarding adrenal tuberculosis:

First. The supra-renal bodies are far more susceptible to tubercular inflammation than to any other form of disease.

Second. Addison's disease occurs oftener in conjunction with tuberculosis than with all other diseases together, or in approximately 80 per cent. of all cases. Hence, when tuberculosis invades the adrenals Addison's disease usually develops, although other and more important factors may be concerned in the process.

We find all the later stages of tubercular inflammation and of tubercular deposits in the adrenals, but their exact nature and extent have never been shown to bear any definite relation to the accompanying symptoms. Tubercle bacilli have been reported as present in the adrenals in a score of cases, but more often they are not found. In three recent instances the adrenals have given very marked reaction to inoculation with Koch's tuberculin, and in one of these there was extensive hemorrhage into the degenerated supra-renal body. In the great majority of cases both adrenals are involved; when the tubercular process is present in but one, the left is affected twice as often as the right.

The local tuberculosis frequently commences as a primary chronic inflammation, interstitial, and accompanied by the formation of small tubercles, which enlarge, coalesce, and degenerate to caseous masses that may soften and honeycomb the entire adrenal structure with cavities which are often described as containing pus, though the material is usually simple granular débris with oil globules. This substance may be replaced by calcareous matter, and sometimes, but less often, atrophy ensues. The inflammatory process commonly begins in the medulla and extends to the cortex, gradually obliterating all original structure, but the reverse may be the case, or both may be simultaneously affected. Adhesions and thickened masses of connective tissue, or deposits of fat, are very apt to form about the adrenal bodies, and it is important to note that such changes often involve or include the adjacent sympathetic nerve and ganglia.

THE RELATION OF ADDISON'S DISEASE TO OTHER DISEASES THAN TUBERCULOSIS.

This subject deserves brief mention.

Malarial Fever.—The accompanying anæmia in Addison's disease, and the fact that the spleen has certain physiological influences in regard to the chief pigment of the body, suggests the question whether malarial fever is associated in any special manner with the former affection. In the cases which I have personally seen there had been many attacks of malarial fever. Other observers have commented upon a similar coincidence. Lewin reports forty-five cases. But it has not been shown

that Addison's disease is more frequent in those regions where malaria is most severe, nor does it bear any constant relation to malarial paroxysms when the two diseases coincide. The spleen is sometimes hyperæmic and is pigmented in Addison's disease, but it is frequently normal, and our present knowledge does not enable us to recognize an etiological relation between the two affections.

Carcinoma.—With regard to carcinoma of the adrenals, whether it involves them primarily, as it has been rarely known to do, or by extension from contiguous organs, it is a remarkable fact that, as a rule, this lesion does not provoke either pigmentation of the skin, or typical symptoms of Addison's disease. Such a result has only once or twice been recorded (Fleiner, *Berl. klin. Wochenschr.*, December 23, 1889). The same may be said of sarcoma and adenoma.

Caries.—Several cases of vertebral caries have occurred in conjunction with symptoms of Addison's disease, in which the local sympathetic system was also more or less involved.

Goitre.—Three cases of coincident exophthalmic goitre have been observed. This fact is of special interest from the possibility of a connection having existed between abdominal and cervical sympathetic nerve lesion or irritation.

In general, it must be admitted that no other disease than tuberculosis accompanies Addison's disease with sufficient frequency to be regarded as among predisposing causes.

Traumatism, or strain affecting especially the muscles of the back, has been reported several times as the exciting cause of Addison's disease in cases in which tuberculosis could be excluded.

In one instance the disease followed immediately upon a severe wrench of the back acquired while skating, and in another a fall into ice-cold water. Several cases have developed in connection with psoas and lumbar abscess from injuries of the spine.

AGE.—Addison's disease was originally held to belong only to adult life. Lately, however, two cases have occurred in infants only seven days old, and in one eight days old. All showed distinct bronzing. In one infant one adrenal was cystic and not caseous. Girode (*Bull. de Soc. Anat.*, April, 1891) reports the history of a newborn infant who had syphilitic adrenal gummata, without bronzing. Addison's disease has been observed in almost every year of life from birth to the eighty-first.

SEX.—Sixty per cent. of all cases occur in males.

DURATION.—While the average duration of all cases is from two or three months to a year, there are remarkable exceptions. One patient has lived ten years and another nearly eleven years (Schreiber, *Berl. klin. Wochenschr.*, October 13, 1890; Schmaltz, *Deutsche med. Wochenschr.*, September 4, 1890). A number of others are reported as

living respectively four, five, seven, and eight years after pigmentation was first observed.

It is difficult to account for the prolongation of life in a few cases of a disease which is otherwise so uniformly fatal at an early date.

SYMPTOMS. *Pigmentation.*—The belief that adrenal lesions are responsible in any direct manner for the bronzing of the skin, and sometimes the mucous membrane, is not sustained by analysis of reported autopsies. The theory has been advanced that the adrenals were more glandular structures than nerve organs (Virchow), and that the bronzing is due to a glandular chromogenic action of the supra-renal bodies. In other words, first, that they either alter normal hæmoglobin, constantly passing through their abundant bloodvessels, and return it to the blood; or, second, that they form new pigment when diseased; or, third, that, becoming diseased, a certain controlling influence ordinarily exerted over the blood pigment is removed. Many facts derived from a careful study of the embryology, physiology, and pathology of the adrenals are arrayed against these views.

The adrenals have long been known to furnish peculiar color reactions (Vulpian et Baunie, *Gaz. hebd. des Sci. Méd. de Bordeaux*, 1888, No. 11). They become reddened by oxidation in light and air, are blackened by per-salts of iron, and turned green by dilute iodine solutions. Klebs has claimed that following irritation a chromogenic body is stored in the adrenal cortex in increased amount.

I have repeated the color test with the adrenals of man and nearly all the domestic animals, and have never found them to fail. The deep green produced by brushing the freshly cut surface with sesqui-chloride of iron affects the medulla and not the cortex. This reaction is unique. Notwithstanding the peculiar color reactions, there is no conclusive evidence that the pigmentation of Addison's disease depends upon alterations in the blood; for the bronzing is often great while the blood is normal and no excessive pigment has been found in it, neither is the urinary pigment increased. The only remaining hypothesis is that there is some peripheral sympathetic influence at work which causes the deeper cells of the rete Malpighii to appropriate and alter the blood pigment which circulates in the capillaries among them. This pigment is found in the protoplasm of the younger cells in the situation where it is normally present in the negro in excess (Sjostrom, *Deutsche med. Wochenschr.*, May 30, 1889). Jürgens (*Deutsche med. Zeitung*, May 10, 1888), believes that some pigmentary substances may be deposited through peripheral nerve excitation, originating in epithelial degeneration or external irritation, hence the pigmentation is most decided where the skin is exposed, in the face and hands, on flexures and folds, etc.

Gade (*Fortschritte der Med.*, 1889, No. 12, p. 452), who has found pigmentary deposits in large branching cells in the velum palati and tongue,

as well as in other mucous membranes and the skin, believes that the bronzing of Addison's disease is not the result of any specific action, but is merely an increase in the normal amount of pigment locally deposited from the hæmoglobin.

The fact has been confirmed by many observers (Lancereaux, Nothnagel, Fleiner, *et al.*), that the pigmentation occurs most prominently in those cases in which the sympathetic nerves are found diseased. I have been told by Dr. C. S. Bull that he has examined the eyes of a number of patients with Addison's disease, but never found increase of pigment in the fundus oculi, though in one case it was present in excess in the iris.

I have referred to 112 cases of adrenal lesion in which no bronzing appeared at any time. These abnormalities were of great variety, covering the range of pathological changes from simple hyperæmia to advanced caseation or calcification of the entire adrenal structure, yet at no period were the integument or mucous membranes pigmented in the slightest degree.

If the pigmentation of the surface depended upon functional derangement merely of the adrenals, by abolishing a control over the normal blood pigment, surely it could not be absent throughout widespread progressive destruction of their tissue. On the other hand, it cannot be alone due to new pigment formed by the supra-renal bodies, for fully twelve per cent. of all cases of typical Addison's disease have been unaccompanied by any adrenal lesion whatever.

Chemical analyses (Thompson and Costello) of the supra-renal bodies, in addition to the excess of pigment above described, shows that they contain leucin and myelin in quantities out of proportion to the number of nerves, also traces of hippur taurocholic, and benzoic acids, but nothing which is peculiar to the adrenals, or which is not found in other situations in the body in greater amount.

OTHER SYMPTOMS AND VISCERAL LESIONS IN RELATION TO ETIOLOGY.

Careful analysis of the symptoms recorded in all cases of Addison's disease shows considerable uniformity in the occurrence of functional or other disorders of the alimentary canal and of the circulation, and suggests very forcibly the probable existence of a common cause to be found in disturbance of the abdominal sympathetic system.

Vomiting.—In almost every case nausea and vomiting are present, and with asthenia they are often the first symptoms observed. The vomiting, at first paroxysmal, occurring at very irregular intervals, becomes more and more frequent and severe. It is not referable to errors in diet, nor to gastric lesions. In a few instances slight gastritis or hyperæmia or pigmentation of the mucous membrane of the stomach have been noted, but these conditions are neither frequent nor prominent enough to account for the severe emesis.

It has been suggested that this symptom is due to an altered condition of the blood, or to the presence of some toxin generated by the suprarenal bodies. But the vomiting may occur long before there has been time for alterations in the composition of the blood to appear, and the latter are usually neither frequent nor serious. It seems more probable that the emesis is due to an irritation of the cœliac plexus, which reaches the vomiting and respiratory centres through branches of the vagus nerve. We have many proofs of the possibility of this occurrence, and a functional irritation of the sympathetic nerves even without destructive lesion may be a sufficient factor, as in the vomiting of pregnancy, forms of severe abdominal pain like that accompanying the passage of gall-stones, or renal calculi, certain ovarian diseases, etc.

Diarrhœa.—The same argument may be employed to account for the diarrhœa which is so commonly present. This is found to be more than twice as frequent as constipation, which as a rule occurs only at the commencement, and as in the case of vomiting, it does not bear any definite relation to errors in diet, nor is it excited by other common influences, such as exposure to changes in temperature, intestinal hyperæmia, etc. Lesions of the intestine, excepting occasional hyperæmia and ecchymosis, and cases where general tuberculosis with ulceration exists, are so rare as to be regarded merely as coincidences. On the other hand, there is much experimental evidence in favor of the belief that diarrhœa, like emesis, is produced in this disease by splanchnic irritation rather than by altered blood or any other agency.

Lewin and Israel have shown that removal of the cœliac ganglion produces at first constipation and later diarrhœa, and the musculo-motor and vasomotor impulses which emanate from it may be so modified by expermental irritation as to alter peristalsis, or produce local anæmia or hyperæmia. These results have been confirmed by others. In animals extirpation of the solar plexus gives rise to hyperæmia, ecchymoses and ulceration in the wall of the stomach and upper portion of the small intestine.

In a few instances atrophy or swelling and pigmentation of the solitary and Brünner's glands and Peyer's patches have been recorded, and this may be explained by the influence of the cœliac plexus through altered trophic impulses. That these lesions are not more frequent may be due to the fact that the trophic influence is not very strong, or it is modified by the local plexuses in the intestinal wall.

Nothnagel has shown a relation to exist between atrophy of the intestinal wall and atrophy of the intestinal sympathetic plexus, although the splanchnic nerves were intact.

Changes in the other abdominal viscera are neither frequent nor extensive, and consist mainly of hyperæmia, which might also be due to sympathetic irritation or lesions.

The spleen has been found hypertrophic and often soft and pigmented, but it has been pointed out that the occurrence of coincident malarial fever with Addison's disease is not unusual.

The liver may be hyperæmic, cirrhotic, tubercular, or, as in one of my cases, syphilitic. There is nothing characteristic of Addison's disease in its various lesions. The mesenteric glands are frequently enlarged and caseous, but this is mainly in distinctly tubercular cases.

The kidneys and urine are usually normal, and mellituria has not been observed. Hyperæmia and moderate hypertrophy of the kidneys are reported in a few instances. This is also possibly due to blood stasis or altered blood-pressure produced through splanchnic irritation.

Pain and Tenderness.—In fully one-third of the cases, sharp neuralgic, or more often severe dull aching pains are present, and referred principally to the lumbar region, but also to the deep epigastric and hypochondriac region. The pain in most cases has been accompanied by extreme local soreness and tenderness on pressure (Henry, *Trans. Path. Soc. Phila.*, vols. v., x). Müller (*Handb. der Physiol.*, i. p. 579), and Höffter (*Henle u. Pfeuffer's Zeit.*, N. F., iv. S. 322), have demonstrated that experimental irritation of the cœliac ganglion gives evidence of acute sensibility; and severe colic may, of course, occur independently of serous or intestinal muscular lesions. It seems, then, probable that the lumbar and abdominal pains of Addison's disease may emanate from splanchnic irritation.

The Lungs.—In about two-thirds of the cases the lungs or bronchial glands have been affected in various ways. The majority of cases are tubercular. In other instances hyperæmia, œdema, and pigmentation are recorded with pleuritic adhesions. Caseation and hypertrophy of the bronchial glands have been reported. The frequent occurrence of tubercular degeneration of the adrenals is thus explained in many instances as a secondary involvement, following the primary infection of intra-thoracic tissues.

The Pulse.—The modifications in the circulatory system are mainly referable to the pulse, which is uniformly small, compressible, and feeble, and usually rapid in the latter stages of the disease. Heart lesions are infrequent and the valves are usually normal. Atrophy of the heart has been observed twenty-seven times, and hypertrophy, brown pigmentation and fatty degeneration have occasionally been found. These conditions are too infrequent to account for the enfeeblement of the pulse, and since the latter may be present in acute cases when the blood appears normal, and before the general nutrition of the patient is seriously impaired, it is highly probable that it is due to functional or reflex disturbances of the circulation coming from the abdominal sympathetic system.

When the vasomotor tone in the splanchnic system is lowered by experimental irritation, the general arterial pressure is reduced, producing cerebral anæmia and lessening the vagus tone. As a further result, the

pulse becomes quick, small, and compressible. The theory is advanced by Henry and others that paralytic distention of the abdominal blood-vessels is produced through functional or organic causes by their acting upon the sympathetic system, disturbing the equilibrium of the circulation.

The central nervous system exhibits no typical lesions. Cerebral anæmia and hyperæmia are both recorded in about a dozen cases. Vertigo is frequently observed, and there is often mental weakness and depression, with loss of energy. In protracted cases delirium and coma result, and in a few convulsions have been present. It is not uncommon for death to occur very suddenly through a condition resembling shock, or as it sometimes follows severe blows upon the abdomen. Patients are very apt to show more or less lethargy and mental dulness.

The asthenia, which is usually pronounced, appears so early that there is no muscular atrophy and no loss of adipose tissue, and it is difficult to believe that it is not due to nervous influences rather than to changes in the blood, or malnutrition. Dyspnœa may accompany this condition.

The Blood.—Anæmia is common but by no means extreme, and careful clinical study of the blood fails to establish satisfactorily the theory that the disease is essentially a blood disease. Free pigment is not found. While the red corpuscles may be diminished in number they do not appear otherwise abnormal, and in certain typical cases anæmia has not been present. In some of the more acute cases the symptoms become well marked before the general nutrition has been appreciably impaired. The hypothesis that the symptoms are due to a toxin developed by the adrenals and discharged into the blood is not supported by evidence of value, and many facts are directly opposed to it. Ecker first described the adrenals as blood glands, in 1846, before Addison's disease was thought of, and recent inoculation experiments with the thyroid and various gland substances, and the general belief that the chemical composition of the blood is normally influenced by many different organs of the body, tempt one to regard the adrenals as possibly possessing a similar control, but the experiments upon animals, which I will presently report, fail to support this theory.

Rare symptoms have occasionally been observed complicating the usual type of Addison's disease, and they are of interest only in connection with the possibility of origin through extreme irritation of the sympathetic nerves. One instance of salivation is reported, one of bromidrosis, and one of nutritive disturbance in the mammæ, uterus, and other female generative organs. The mammæ and ovaries were greatly atrophied (Kleinwachter, *Lancet*, January 25, 1891). The disease has once been observed in a "bleeder." (Schmaltz, *Deutsche med. Wochenschr.*, September 4, 1890.)

The group of symptoms above considered—namely, the nausea; irritable paroxysmal vomiting and diarrhœa; localized lumbar and epigas-

tric pain; enfeebled pulse; mental apathy and prostration; and the hyperæmia—all point toward a common origin in a lesion which excites or irritates the abdominal sympathetic system, and not necessarily the semilunar ganglion alone, but at times the stomachic, hepatic, or mesenteric plexuses.

EXPERIMENTS UPON ANIMALS.

For the past four months I have been experimenting at the Loomis Laboratory upon the supra-renal capsules of various animals.

Without entering too much into details in this paper, I will briefly state the results: The experiments were performed upon the cat, dog, rat, guinea-pig, and rabbit, and consisted of transplantation, excision, and destruction of the adrenals, and inoculations of aqueous and glycerin extracts made from the adrenals of these animals, and from man in a case in which the capsules were obtained from an autopsy six hours after death from chronic cardiac disease.

Transplantation was performed by inserting the freshly excised adrenals from an animal of one species in the abdominal wall or abdominal cavity of another. After a few days or a week the adrenals were found degenerated, softened, and apparently undergoing absorption.

Excision of the adrenals is one of the most difficult operations which I have ever undertaken upon animals, especially in the dog. They are so deeply situated that they are difficult to reach from behind, on account of the thickness of the muscles of the back, and if approached from the front or side, so much displacement of overlying organs is necessary that irritation or injury of adjacent nerves is unavoidable. Moreover, in all the animals used, a very large vein from the abdominal muscles lies directly across the ventral surface of the adrenals in a groove which divides them into two lobes connected with a narrow isthmus. This vein is joined by a relatively large branch from each supra-renal body. The latter usually lies on the right side in direct contact with the vena cava, and on the left with the renal vein. It is therefore almost impossible to ligate the muscle vein, and of course hemorrhage from such a large branch of the vena cava or renal vein is soon fatal. To obviate this occurrence I have destroyed the adrenal bodies by the actual cautery. Animals thus treated make a good recovery and exhibit no symptoms. There is no increase in pigment of the mucous membrane or elsewhere, the blood is normal and digestion is good. A similar lack of symptoms is observed after transplantation of the glands.

A curious fact in relation to the adrenals has been observed by Stilling (*Virch. Arch.*, December, 1889), namely, that in a young animal after extirpation of one of these bodies the other hypertropies to a considerable extent. The result would seem to indicate that the organ is not a mere relic of the embryonic state, but is of some functional value.

Ablation of both adrenals is reported by many observers to cause death within a period varying from a few days to several weeks, and Tizzoni claims to have found resultant lesions of the nature of alterations in the walls of bloodvessels, hemorrhages, extravasations, and disturbances of the lymphatic circulation. He also claims to have observed in connection with the brain and cord, infiltration with leucocytes and fibrinous exudation, but these results have not been corroborated by any of the numerous experiments made by others when careful antisepsis is maintained.

Arnaud, Marino-Zucco and Guarnieri have extracted substances from fresh supra-renal bodies which they describe as acting as toxins. After using rigid antiseptic precautions they found that injection, even in small doses, of these materials subcutaneously or into the veins of dogs, rabbits, and guinea-pigs, produces death in a short time.

One substance isolated by them is described as a phospho-glycerate of neurin. I have made a number of inoculation experiments upon animals with glycerin and aqueous extracts prepared from the freshly excised adrenals, and am convinced that if proper antiseptic precautions are employed, the supra-renal bodies possess no toxicity when ingrafted or inoculated in animals.

An extract of both adrenals from a dog injected into another dog or into a cat or rabbit, seems entirely without effect. In some cases I repeated the inoculations with the extracts several times in the same animal, which was kept alive for two months without symptoms.

Jaboulay (*Lyons Méd.*, November 2, 1891), has described the occurrence of accessory supra-renal bodies situated upon the semilunar ganglion and in the midst of the solar plexus. I have several times observed these supernumerary bodies, and they have been reported as occasionally present in man.

Lesions of the Sympathetic System.—It is greatly to be regretted that thorough microscopic examination of the abdominal sympathetic nerves and ganglia has not been more frequently made in the reported cases of Addison's disease, for there is good reason to believe that lesions can be very often found in these structures. The earlier records are practically valueless in this regard, for they were made at a period when the technique of nerve preparation and staining was very imperfect as compared with present methods, and slight lesions even if sought for might easily have escaped observation.

The research of the past four or five years, however, is constantly bringing to light an increasing proportion of cases of Addison's disease in which the condition of the various sympathetic nerve structures is shown to be abnormal. The ganglia are often excessively pigmented, sometimes hemorrhagic. They may exhibit fatty degeneration, swelling, and even caseation and suppuration. Their nerve-cells are atrophied,

the vessel walls are thickened and infiltrated, the nerves have a thickened perineurium, and there may be degeneration of the axis cylinders. Such degenerative changes have been lately observed in the splanchnic, in the semilunar and solar ganglia, and in the plexus surrounding the abdominal aorta. Fleiner (*Berl. klin. Wochenschr.*, No. 22, 1891), gives an account of two typical cases in which signs of inflammation were present in the ischiatic, crural, median, and vagus nerves. In one case there was a neuritis of the lower posterior spinal nerve roots, and some degeneration of the posterior columns of the cord. (Kalindero and v. Bates, quoted in *Schmidt's Jahrb.*, No. 1, 1893.) Such cases may be coincident with adrenal degeneration or occur without it; not infrequently the diseased adrenals are adherent to surrounding organs, and various sympathetic nerve branches are included in the proliferated connective tissue.

Armand and Alezais (*Semaine Méd.*, October 7, 1891; *Marseilles Méd.*, January 30, February 28, March 30, 1892) have examined microscopically the lesions of a large number of cases, and they failed to discover nerve-cells in the medulla of the supra-renal bodies, but upon their periphery, especially at the posterior surface, are "peri-capsular ganglia," which they declare are always implicated in Addison's disease, even when the semilunar ganglion and sympathetic nerves are not. On the other hand, Lewin (*Charité Annalen*, vol. x. p. 722) describes many axis cylinders in connection with ganglion cells in the adrenals.

I have been able to find only 81 published histories in which positive mention is made of the sympathetic system, and four of these may be regarded as incomplete, because no note is made of microscopic examination. Of the remaining 77 cases, 60 presented decided lesions of the sympathetic nerves or ganglia. Among the 30 cases most recently examined 27 had such lesions. This is certainly a very striking fact, taken in connection with the analysis of the symptoms of Addison's disease above given, in which I have attempted to show the possibility of the direct cause being an irritation proceeding from the abdominal sympathetic system. Are we not in a position to adopt the following

CONCLUSIONS.

First. That Addison's disease is a condition arising from and dependent upon irritation of the abdominal sympathetic nerves through lesions of themselves, their ganglia, or diseased supra-renal capsules.

Second. In the great majority of instances (fully 80 per cent.) the disease originates as a secondary or primary tuberculosis in the adrenals, and the sympathetic system is either involved by extension of pathological processes, or is functionally disturbed and irritated through the intimate anatomical connection existing between the adrenals and the relatively large number of nerves which they contain.

Third. Actual lesion of the sympathetic system, while far more common than heretofore supposed, is not necessary to produce the varied symptomatic phenomena of the disease. Functional disorder, through irritation conveyed from the adrenals, may sometimes cause all the symptoms—just as in chorea and in many of the conditions of aggravated hysteria, and other functional nervous disorders, we are often unable to find definite lesions.

Fourth. In a certain proportion of cases (not over 20 per cent.) the adrenals are affected by some other lesions than those of tuberculosis, or else they remain normal (in 12 per cent.) and the sympathetic nerves and ganglia are alone diseased.

I am aware that the objection may be raised that excessive pigmentation and even more extensive alterations are not infrequently found in the sympathetic ganglia, giving rise to no symptoms whatever (as in Case XXVI. above reported), and also that there is a tendency of late among physiologists to assign less independence and less functional importance to the sympathetic nerve system. In Addison's disease there are but three reasonable hypotheses to account for the symptoms, namely, that it is a blood disease; that it is due to adrenal toxins; or, that it is due to sympathetic irritation, either functional or organic. The latter hypothesis, while perhaps not wholly satisfactory, appears to be supported by much weightier evidence than either of the others.

While these views are not new (*vide* Greenhow "On Addison's Disease," Croonian Lectures for 1875), by many they have not been finally adopted, because experimental and statistical data have been very slowly accumulated; and it has been my aim, by experiment and by analysis of all recorded cases, to place on a somewhat firmer basis the belief that Addison's disease is dependent upon lesion or irritation of the abdominal sympathetic nervous system.

THE BACILLUS PYOCYANEUS PERICARDITIDIS.[1]

By Harold C. Ernst, A.M., M.D.,
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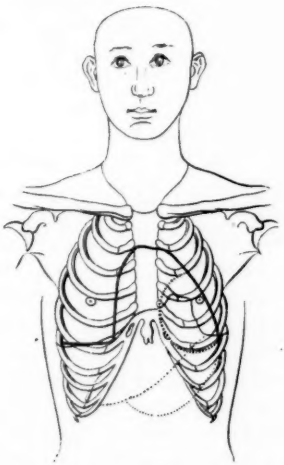
Much attention has been given of late years to the effects of the cultures, and their products, of Gessard's B. pyocyaneus, especially in anthrax. At various times authors have announced the isolation of bacteria very closely resembling this, but the only one that seems to have gained a permanent place in literature is the B. pyocyaneus β of

[1] Presented at the annual meeting of the Association of American Physicians, May, 1893.

P. Ernst, described by him a number of years ago. The differences, as given, are not marked, and Gessard is not inclined to acknowledge that they are due to more than temporary conditions, which appears the more justifiable, for the reason that these differences are largely simple variations in degree and intensity of color-production. It is not only upon differences in degree of color-production that the separation of the organism described in this paper depends, but upon differences of size as well, and the position taken appears to be justifiable because these differences have been found to be constant through a long series of cultures and controls.

The material from which the bacillus was originally obtained was placed in my hands by Drs. Councilman and Whitney, and came from a case in the service of Dr. F. C. Shattuck (at the Massachusetts General Hospital—"having been sent into the house from my service in the O. P. D."), to whose courtesy I am indebted for the following notes from the records.

October 26, 1892. J. E. H., aged forty-seven years, male, laborer, Demerara. No family history. Denies venereal disease. Pneumonia eight years ago. Malaria three years ago, with no periodicity. Signs of effusion about the heart, as per diagram, showing dull area to right



Oct. 27, 1892. Line of effusion. Systolic murmur within broken lines.

of sternum and included in heavy black line. To the right of the sternum was heard a to-and-fro friction murmur, high pitched and well marked. Respiratory murmur not heard over the dull area. Fibrillary twitching of the left pectoralis major. Cardiac sounds more and more muffled as the apex was approached.

November 18. Examination of lungs absolutely negative. Some cough at night with no expectoration.

19*th*. Pericardium tapped in fifth interspace just inside the line of flatness. About three-quarters of a quart removed and sent to Dr. Whitney for examination. Reasons for tapping: 1st. Increasing and disproportionate rapidity of respiration as compared with the pulse and temperature curves. 2d. Increasing loss of flesh and strength. 3d. Non-absorption of fluid in pericardium. 4th. Sudden attack of weak heart and embarrassed respiration.

26*th*. Tapped again. Some of fluid sent to Dr. Councilman, who reports plenty of tubercle bacilli and a new bacillus which liquefies gelatin.

December 17. Tapped a third time; one quart and one gill removed.

March 5. Tapped in sixth space half an inch outside of nipple, and a pint of yellow turbid fluid obtained.

12*th*. Eloped (and could not be traced).

As will be seen from these brief extracts, the case is one of extreme interest from a clinical point of view. It will be reported at length by Dr. Shattuck in connection with others. The part of it that should be spoken of here concerns only the gross appearances of the fluid removed at the various tappings, and the micro-organisms it contained.

The results of the last tapping I did not see. Those of November 26th and December 17th were a fluid, clear and amber-colored, faintly alkaline, and depositing a slight sediment only after standing. There was no odor, but a very large per cent. of albumin, the fluid coagulating very readily by heat, and when sterilized forming an apparently very favorable medium for the development of the bacillus found in it.

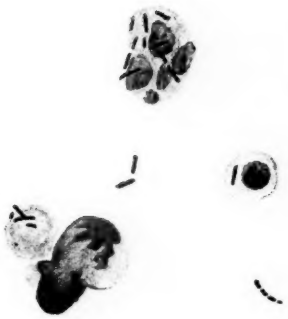
The microscopic examination by Dr. Councilman showed a number of the bacilli of tuberculosis and a second bacillus whose arrangement *in the cells* of the fluid attracted his attention, because of its unusual character. (See Plate.)

At my request a portion of the fluid was given to me for bacteriological analysis. Plate cultures in gelatin, and needle cultures in blood serum showed the presence of no other organism than one corresponding in its appearance, under the microscope, to that seen in the original fluid. Such an examination was made a second time of the fluid removed upon December 17th, with the same results. From these cultures, a long series of tests have been made upon a large number of different media, and under different conditions of temperature.

Every step in the investigation has been checked by and compared with cultures of the bacillus pyocyaneus derived from the following sources:

1. My own laboratory culture, which came originally from the Hygienic Institute, in Berlin, and has been under constant cultivation.

2. The laboratory of Johns Hopkins University; sent to me by Dr. Welch, he being not quite certain of the origin of the culture.



Cover-glass preparation of pericardial fluid, stained by the Koch-Ehrlich method. The red rods are bacilli of tuberculosis. The blue rods are the bacillus pyocyaneus pericarditidis. (Comp. oc. 12. Apochrom. obj. 1.30. Camera lucida.)

3. The laboratory of the College of Physicians and Surgeons; sent to me by Dr. Cheesman, at Dr. Prudden's request, and coming originally from Prague.

4. The Army Medical Museum ; given to me by Dr. Gray, and of uncertain origin.

Inasmuch as cultures from all these sources substantially agreed in gross appearances and under the microscope, minor variations in rapidity of growth and intensity of color-production being left out of account (for these were more in one at one time and in another at another), and at the same time, inasmuch as they all differed in the same way and under the same conditions from this new bacillus, the conclusion is irresistible that the organism is in reality an undescribed variety, and differs from the bacillus pyocyaneus by well-marked and constant characteristics. The results of the culture experiments have been tabulated for convenience sake, and the description of the B. pyocyaneus of Gessard and the B. pyocyaneus β of P. Ernst are added for ease of comparison. These are the only two organisms with which this B. pyocyaneus pericarditidis is in the least likely to be confounded.

BACILLUS PYOCYANEUS PERICARDITIDIS.

ORIGIN. Pericardial fluid, containing also bacilli of tuberculosis.

FORM AND ARRANGEMENT. Small straight bacilli, with rounded ends, three or four times as long as broad, and on most media slightly larger than the B. pyocyaneus of Gessard, occurring within the cells in the original fluid, and sometimes showing two or three end to end, but never observed in long chains.

MOTILITY. Actively motile in hanging-drop culture. No cilia or flagella have been demonstrated.

GROWTH. *Gelatin: Plates.*—Colonies appear at the end of 36–48 hours, as fine white points in interior, and upon the surface of the medium ; edges are sharply defined; soon there appears a circular zone of liquefaction, finally passing through the stratum of the medium with the colony at the bottom. Under a low power the centre of the colony may be of a brownish color. On the second day a greenish tinge may be seen about the individual colonies on the surface which spreads through the entire medium. The plates may always be distinguished from those of the B. pyocyaneus of Gessard by the *bluish-green* when contrasted with the yellowish-green color of this latter.

Gelatin: Needle cultures.—At end of 24 hours a small saucer-shaped depression of liquefaction at upper end of needle track, which gradually spreads and deepens until the liquefaction extends straight across the tube and about half-way down the needle track. A bluish-green fluorescence appears about the liquefied portion at the very upper part of the gelatin, later changing into a yellowish-green. The colony is deposited as a yellowish heavy sediment at the bottom of the liquefied portion, the upper part of which is clear. A small whitish growth occurs along the remainder of the needle track. Old cultures, in which a certain amount of evaporation has occurred, assume a very dark greenish-black color.

Agar-agar.—Along the needle track appears a *flat*, dry colony of a dirty grayish-white color spreading out upon each side of the needle track and growing, at first, upon the surface of the water of condensation, later depositing a white sediment at the bottom. From the first there may be detected, by reflected light, a metallic lustre on the surface of the colony in places,

which metallic sheen later spreads over the whole colony and furnishes a marked differentiating point. In addition to this, within 24–48 hours at 37° C., there appears a green fluorescence throughout the whole of the medium, which increases slowly to a marked *bluish-green* color, and never assumes the nut-brown of the B. pyocyaneus of Gessard upon the same medium. The colony is not especially viscid.

Potato.—There appears a reddish-brown colony along the needle track, elevated and moist, confined to the line of the needle. Presents no change of color upon touching with needle, but certain specimens (as do some of the B. pyocyaneus) develop later a heavy green color extending over the whole surface of the potato, which later changes almost to black.

Bouillon.—Twenty-four hours at 37° C. gives a growth, especially on the surface, which is a wrinkled scum; no cloudiness of the bouillon, and a very faint greenish fluorescence .1 cm. below surface. At this time differs from the B. pyocyaneus of Gessard, in that the latter shows cloudiness of the medium all through. Later the same cloudiness appears in bouillon cultures of this new bacillus, together with a whitish sediment deposited at the bottom of the tube, and then the cultures are indistinguishable from each other. Same changes, but slower, occur at room temperature.

Peptone.—1, 3.5, and 6 per cent. solution. Twenty-four hours at 37° C. gives faint bluish tinge at upper edge of medium with very faint cloudiness; later (in one to two weeks) there forms a marked scum upon surface that is difficult to break up by shaking, and the whole medium assumes a grass-green color of more or less intensity and not seen on other similar bacilli. The shape and size of the organism, under the microscope, differs very markedly in this medium from any other bacilli examined. Same changes to be seen at room temperature, but more slowly.

Egg-Albumin: Plain.—Twenty-four hours at 37° C., yellowish-white, very profuse growth all along the needle track; yellowish-green spreading out from it almost to sides of tube, and in the condensation water as well. The growth has no especial distinguishing characteristics. Irregular liquefaction occurs, but the growth at no time differs in any marked way from other varieties of the B. pyocyaneus.

Blood-serum.—Twenty-four hours at 37° C. shows flat, moist colony with bluish-green fluorescence in its neighborhood. Liquefaction begins early and goes on slowly until complete in from one to two weeks, with an increasing intensity of color which becomes markedly blue, and eventually almost black.

Milk.—Behaves as do the other bacteria.

BEHAVIOR TO TEMPERATURE. Grows at 15–25° C., slowly; much more freely at 35–38° C., when it produces the color more quickly.

RAPIDITY OF GROWTH. Moderate.

SPORE-PRODUCTION. Not observed.

NEED OF AIR. Does not grow under mica. Facultatively anaërobic, but does not produce color except with free access of oxygen.

GAS-PRODUCTION. Produces faint foul odor.

BEHAVIOR TO GELATIN. Liquefies gelatin slowly.

COLOR-PRODUCTION. Produces a bluish-green color which in old cultures changes almost to a black. Upon the addition of acids (both vegetable and mineral) to cultures the color changes to red, and upon the addition of alkalies a bright grass-green appears. This reaction is best seen in bouillon and gelatin cultures, but occurs in other media as well, notably blood-serum.

BEHAVIOR TO ANILINE DYES. Stains easily and well with any of the aniline dyes usually employed, and by Gram's method.

MICROSCOPIC APPEARANCES IN DIFFERENT MEDIA. Under the microscope its general appearance on various media is of a rod larger than the B. pyocyaneus. In peptone cultures this difference is very marked. In this case, the B. pyocyaneus tested appeared as very short oval bacilli, almost like micrococci, while the new bacillus showed as a long fine rod, from four to six times as long as broad, about one-half the diameter of a red blood-corpuscle, and arranged sometimes two or three end to end. These same

cultures transferred to gelatin became indistinguishable from each other in size.

PATHOGENESIS. Injections of small quantities (0.5 cm.) of a bouillon culture twenty-four hours old into the abdominal cavity of rabbits and guinea-pigs, killed 50 per cent. in from twenty-four to thirty-six hours. Autopsy showed general congestion of abdominal viscera, slight effusion into the peritoneal cavity, and cover-glass preparations and cultures showed the bacilli in the effusion in the abdominal cavity, as well as in the blood from the heart and various organs.

BACILLUS PYOCYANEUS. (GESSARD.)

ORIGIN. In "green" pus. Really the green color only appears after exposure to oxygen, so that the pus itself is never green as a result of growth of the organism.

SHAPE AND ARRANGEMENT. Short fine rods; often can be confounded with cocci.

MOTILITY. Actively motile.

GROWTH. *Gelatin: Plates.*—After two or three days the entire plate has taken on a clear green color (grass-green), the surface colonies liquefying the gelatin in a funnel shape. Under a low power the deeper colonies appear round and somewhat yellowish, with clear, strongly refracting granular edges.

Needle cultures.—After twenty-four hours the upper surface of the gelatin is liquefied in a funnel-shaped depression with fluorescent coloring (grass-green) of the upper surface. The liquefaction later extends straight across above the solid portion to the sides of the tube, and the whole gelatin takes on a beautiful fluorescence.

Agar-agar.—Moist greenish-white layer along the needle track and spreading out on each side, and the whole agar becomes colored with a diffuse, beautiful fluorescence (grass-green), which later turns to a nut-brown color.

Potato.—Dry nut-brown elevated colony along the needle track. With ammonia it takes on a green, with acids a red color.

Milk.—Produces a yellowish-gray layer at upper part; produces casein, and peptonizes it with help of ammonia.

BEHAVIOR TO TEMPERATURE. Grows well at summer temperature.

RAPIDITY OF GROWTH. Grows rapidly.

SPORE-PRODUCTION. Not observed.

NEED OF AIR. Will not grow under mica plates.

GAS-PRODUCTION. Not observed.

BEHAVIOR TO GELATIN. Liquefying.

BEHAVIOR TO ANILINE DYES. Produces blue pigment, pyocyanin. Stains easily with ordinary aniline dyes and by Gram.

PATHOGENESIS. Guinea-pigs inoculated in abdominal cavity are killed (Koch). Rabbits inoculated in blood-current live.

BACILLUS PYOCYANEUS β. (P. ERNST.)

Zeit. f. Hyg., Bd. ii. S. 36, ii.

ORIGIN. In the pus of gray-colored dressings.

FORM AND ARRANGEMENT. Small, very slender rods, not producing chains, but only two or three together at the most, probably possessed of cilia.

MOTILITY. Actively motile.

GROWTH. *Gelatin: Plates.*—Colonies never sharply defined, but with delicate radiating threads, which are always visible, until by liquefying in circular form the colony sinks to the bottom in an irregular mass. The neighboring portion of the medium is colored green.

Needle cultures.—In the shape of, at first, a round and soon a pointed, deeply widening champagne-glass shaped liquefaction with a slowly appearing green coloring of the medium.

Agar-agar.—As a greenish-white but dry layer along needle track, with green coloring of the agar.

Potato.—From a fawn to nut-brown dry colony, which turns gray when touched with the platinum needle. The "chameleon" phenomenon. Different from B. pyocyaneus *a*.

Bouillon.—A thin spider's-web-like growth on surface, which, by shaking, easily collects into skeins and sinks with difficulty. The upper part of the bouillon is colored green.

Milk.—Green color at upper surface; rapid coagulation and energetic peptonizing of the casein.

BEHAVIOR TO TEMPERATURE. Grows at 15–25° C., but luxuriantly at 35–40° C., when it produces the green color more quickly.

RAPIDITY OF GROWTH. Grows with moderate rapidity.

SPORE-PRODUCTION. Not observed.

NEED OF AIR. Strongly aërobic.

BEHAVIOR TO GELATIN. Gelatin is rapidly liquefied and turned into a fluid as thin as water.

COLOR-PRODUCTION. Produces a yellowish-brown color, which very easily changes by oxidation into a dark-green. It is sufficient to shake the cultures, thus bringing in the oxygen of the air, to produce a dark-gray color. Old cultures turn a strong black-brown.

PATHOGENESIS. Not known.

SUMMARY.

The essential differences between this organism and those with which it has been possible to compare it are therefore as follows:

I. *Macroscopic.* 1. The bluish-green tinge of the gelatin in plate culture, as seen by reflected light, as distinguished from the yellowish-green tinge of the others.

2. The dryness and metallic lustre of fresh colonies and the bluish-green color, by reflected light, of old cultures upon agar-agar, as distinguished from the moist elevated fresh colonies, and nut-brown color, by reflected light, of old colonies of the others.

3. The greenish color of the colonies in peptone solutions of varying strength as distinguished from the bluish color of the other bacteria tested with it.

4. The very much greater rapidity and intensity of the reaction of gelatin and bouillon cultures to acids (red color) and alkalies (grass-green).

II. *Microscopic.* The variations in its appearance under the microscope.

1. From gelatin, indistinguishable.

2. From peptone, long, slender rods, as contrasted with short oval ones,

3. On other nutrient media, its general average as a larger rod, which can be made out by comparative examination, but is hardly subject to measurement. It can be seen, however, in preparations from egg-albumin, bouillon, blood-serum and potato. Only upon gelatin and agar is there no appreciable difference.

It appears, therefore, justifiable to conclude that we are dealing with a distinct variety of the bacillus pyocyaneus, and that Gessard's conclusion that there is but one is unfounded.

FINAL RESULTS IN TUBERCULAR OSTITIS OF THE KNEE IN CHILDREN—COMMONLY KNOWN AS "WHITE SWELLING."

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Early in the spring of 1890 I began this investigation, and from that time to the present the bulk of the work has been done by Dr. P. H. Fitzhugh, house surgeon to the Hospital for the Ruptured and Crippled. We succeeded in getting the names of 499 patients who have applied for treatment at the Hospital for the Ruptured and Crippled since 1868, or who have applied at my clinic in the New York Polyclinic since 1882, or at my office since 1884. None have been included in this list who came under treatment since November 14, 1887. An exception might be made of the few who have applied for the correction of deformity or for the relief of an old sprain of the disabled knee. A few of this number are at present under observation, but are not receiving any active treatment. Perhaps many others might have been included in this list but for the lack of uniformity in nomenclature during the early days of my hospital life. For instance, the diagnosis of synovitis or peri-arthritis was made when the cases subsequently proved to be ostitis.

Starting, then, with this number, we aimed to make a personal examination of every case included in this analysis. In the Orthopædic Section of the last International Congress in Berlin, in 1890, I reported progress, but the report was handed to one of the secretaries, and I have up to the present time heard nothing of what disposition was made of my paper. The investigations have been continued with greater zeal, and up to January 4, 1892, we have secured final notes on 300 cases, which is the number on which the paper presented is based. My chief regret is my inability to tell how interesting and how instructive this investigation has proven, not only to Dr. Fitzhugh and myself, but to my associates in the hospital, for the past eighteen months. A large number of patients thus traced have borne willing testimony to the further relief to themselves by reason of this investigation.

Definition.—I find it necessary, before proceeding further with this analysis, to define just what is understood by tubercular ostitis of the knee. Long before Koch discovered the bacillus of tuberculosis it was known that the lesion of common tumor albus, or white swelling, was most active in the ends of the bones forming the knee-joint, and, in quest of a better nomenclature, we spoke quite confidently of an ostitis

of the knee. Since the discovery of the bacillus, and since its absolute demonstration as a potent factor in the etiology as well as pathology of the affection under consideration, the term scrofulous or strumous, as applied to this disease, has been pretty well abandoned. Our definition, then, would be a tuberculous inflammation of the lower epiphysis of the femur, or the upper epiphysis of the tibia, or both, primarily, and a chronic inflammation by contiguity of the immediate joint structures.

Clinical Features.—A child who is usually regarded as the frail member of the family begins to favor the knee by an almost imperceptible limp, or cries out with pain if the limb be moved in the usual way, and the parent immediately thinks of a fall or a sprain of some kind that has occurred while at play. A pretty careful home examination is made, and nothing definite is discovered. Next day or the day following the lameness is not so pronounced, or, at least, the parents think so, the wish being father to the thought, and the child goes about his play as usual. A few days, or sometimes a few weeks, subsequently it is found that the contour of the knee is altered a little, that the child is really more lame, and that more care is required in handling the limb. Then a physician is consulted, the joint functions are tested in a cursory manner, his eye detects the difference in appearance between the two joints superficially, and the case is regarded as either a sprain or a subacute rheumatic attack. If the former, the opinion is expressed that the child has sustained a fall or an injury of some kind. An investigation is instituted, and the opinion is confirmed. All children fall while at play at some time or other, and a severe fall is not necessary to the production of an injury of this kind. The mother or the nurse in this way becomes, by negligence, the cause of the child's disability. On the other hand, if the diagnosis of subacute rheumatism is made, then the father or mother remembers some twinges about the shoulders or some other part of the body that they have experienced, and the professional opinion is here confirmed. Whether the affection be diagnosticated as a sprain or as rheumatism, it is suggested that a few days, or a week or two at least, will decide the matter, and thus the disease makes headway. The lameness persists, the joint is vulnerable, and trauma now begins to play an important part. If the joint functions are fully tested at this time, there will be found reflex spasm on complete extension of the limb, and reflex spasm as the limit of complete flexion is approached. The only satisfactory way of testing the functions of the joint is to test the functions of the correspondingly sound joint, and both limbs should be bare of clothing. One who makes his test in this way will discover also a change in contour. The normal depressions on either side of the patella will be shallower than those on the well side; the ligamentum patellæ itself will show some expansion; the condyles and the head of

the tibia, if pressed upon, will be found tender; there may be a little synovial distention, as shown by palpation and flexion of the limb; there will be found in the majority of instances atrophy of the thigh and of the calf, with increase of the knee measurements; furthermore, by palpation, one or two points of extra heat will be detected. It is in this early stage, though, that these signs are apt to be overlooked, not because the physician is incompetent to detect, or even incompetent to interpret, but they are overlooked because he fails to make an examination.

The symptoms and signs already enumerated belong to what is known as the first stage, that is, the stage preceding deformity. The presence of a distended synovial sac does not always take the disease beyond the first stage, because the inflammatory process in the end of the bone may extend by continuity and contiguity to the synovial sac, under the influence of a trauma, and this temporary synovitis may be but the expression of an exacerbation. I have many photographs of the knee in the first stage, but it is difficult to bring out the points in a large drawing, and hence I have made no effort to present them, but have endeavored to make my description sufficiently graphic to convey my meaning with precision.

Under the influence of impaired nutrition, under the influence of occasional severe traumatisms, and under the influence of the trauma of use, which is almost continuous when the child is walking or playing, the disease advances gradually into what is known as the second stage, or the stage of deformity. In a few instances this stage is never reached, because the original blow has been a light one and the focus of disease has not spread, but has been surrounded by a certain amount of bone sclerosis, thus protecting the patient against further disability. It is not always necessary to have multiple foci in the neighborhood of the joint, any more than it is to have multiple foci in the lung. The dosage of disease is a personal factor that ought not to be overlooked. Among pathologists the dosage of bacilli is always an important factor, not only in the selection of therapeutic measures, but in prognosis. On more than one occasion I have asked the distinguished President of this Academy about a given patient, whom he had sent from home in search of health, and got this reply: "Oh, he is doing very well; he was not struck very hard." The expression is certainly a good one, and I find myself calling it up many times in giving a prognosis about a given case of tubercular ostitis of the knee. This second stage of deformity is attended usually with varying degrees of pain. The muscular spasm is greater; night cries are more frequent; the lameness amounts frequently to absolute inability to walk. It is in this stage that abscess appears. The structures in immediate contact with the knee or adjoining bones are distended, and the suffering becomes at times intense. This in turn

impairs still more the general health. Fomentations and blisters and plasters fail to give relief. The normal contour of the joint is changed into one wherein the skin is glossy, veins enlarged, superficial parts very tender, surface heat increased, and wherein the joint is fixed, any passive motion causing great pain. In this stage, too, we have exacerbations induced by trauma, or impaired health, or both. These exacerbations last from three or four days to three or four weeks. In the intervals the patient walks about, but with the heel raised, toes and ball of foot only touching the floor, the knee-limp still more exaggerated, and assisted by a crutch or cane.

The third stage is generally known as the suppurative stage, and is attended with luxation or subluxation of the tibia and of the patella. The fixation of the limb from spasm of the muscles—which spasm has been caused by the effort on the part of Nature to protect the joint against trauma—is replaced by ankylosis. Destruction of bone takes place, the cicatrices form after sinuses or uclers, actual shortening of tissue takes place. Shortening of the limb is now manifest, and the persistence of suppuration oftentimes induces a septicæmia that baffles medical skill, or an amyloid degeneration of liver and kidneys, or, in some instances, a tubercular meningitis, though patients more frequently develop meningitis in the second stage. It is difficult to fix the limit to these different stages of the disease. Suffice it to say that the average duration of tubercular ostitis is from three and a half to four years. More time might with propriety be devoted to clinical features, but the surgical literature is sufficiently full. I did wish, however, on the present occasion to refresh your minds with the more salient points, in order that you might more fully appreciate the results which have been obtained by art as well as by Nature.

THE ANALYSIS IN DETAIL.

I. *Sex, Side, Age when Disease developed, and Involvement of Other Joints.*

A. *Sex.* For this heading the full number of *cases to be traced* can be employed, and we find 223 females and 276 males.

B. *Side.* There were 239 cases wherein the affected knee was the right, 235 wherein it was the left, and 25 wherein the side was not given.

C. *Age when disease developed.* Forty-seven patients developed the disease before the close of the second year of life; 64 between the second and third; 40 between the third and fourth; 46 between the fourth and fifth; 47 between the fifth and sixth; 33 between the sixth and seventh; 20 between the seventh and eighth; 27 between the eighth and ninth; 15 between the ninth and tenth; 12 between the tenth and twelfth; 20 between the twelfth and fifteenth; 7 between the fifteenth and twentieth; 5 between the twentieth and twenty-fifth; 3 between the twenty-fifth

and thirtieth; 1 at the age of forty-one; and in 112 cases the age was not ascertained.

Unfortunately these 112 cases must be left out of the count, and we have then 387 cases for this part of the analysis, namely, the age when disease developed. In 197 or nearly 51 per cent. the disease developed before they were five years of age; 142 or 36 per cent. between the ages of five and ten. We then have 339 patients or over 87 per cent. of the whole number, in whom the disease showed itself prior to the tenth year of life. In 39 cases or about 10 per cent. ostitis developed between their tenth and twentieth year, while still in the period of youth, and 9 or about 2 per cent. after they had passed the twentieth year of life.

D. *Involvement of other joints.* Much has been written about the involvement of other joints, and the fear is often expressed that the disease may break out elsewhere. Of 499 cases there were only 16, or 3 per cent., wherein other joints or bones were involved, so that the danger is not great. Of the 16, 8 had Pott's disease of the spine; 2, ostitis of the hip, or hip disease; 1, ostitis of the ankle, commonly known as caries of the ankle; 1, disease of the elbow; 1 case had a like disease of the wrist and shoulder; 2 had the affection in the other knee; and 1 extraordinary case had the following joints involved: the other knee, the elbow, and the shoulder.

Of 300 cases, 140 (46 per cent.) had abscess, 160 never had abscess, 40 have died; cause of death as follows: 6 of tubercular meningitis, 14 from exhaustion after prolonged suppuration, 3 from phthisis, 2 from dysentery, 2 from amyloid degeneration, 12 from intercurrent affections not connected with the disease, and 1 from shock following excision. It is fair to assume that 22 died *as a result of the disease*, causing exhaustion from suppuration, tubercular meningitis, and amyloid degeneration. This gives us a mortality of $7\frac{1}{3}$ per cent.

II. *Analysis with reference to Treatment.*

All the cases have been subjected to one of three kinds of treatment, which may be designated as follows:

1. The purely *expectant*, which means the treatment of symptoms with little reference to signs, little reference to correction or prevention of deformity; an effort to relieve exacerbations, and, during intervals, freedom from treatment; the irregular use of apparatus; frequent changes in apparatus, no special form being used sufficiently long to even test the efficiency of the same.

2. The *fixation* treatment. This means the continuous use of some form of apparatus, whether plastic or steel, some of which partially and some completely immobilize. Under this class may be named the posterior Knight brace, the plaster-of-Paris bandage, either solid or cut

down and trimmed up as a splint; and the various forms of extension apparatus in use.

3. The third is the *protective* treatment, which means immobilization of the joint until all acute signs have subsided and convalescence can be safely predicated; the use of an apparatus that prevents concussion or jar—in fact, trauma of any kind—whether in the shape of a perineal crutch or axillary crutches. I do not class under protection splints the ordinary extension apparatus, because the adhesive plasters with which traction is secured slip, and the skin and deeper tissues themselves move, so that jar or trauma is not prevented. Under the term protective may also be included *corrective*, which means the correction of deformity, either by apparatus, by manual force under an anæsthetic, or by incision. It so happens that we depend largely, in the protective treatment, on the Thomas knee splint. This, as you see, is simply a peroneal crutch with high shoe, or patten, for the sound foot. For this reason we have spoken of this as the Thomas method—after the late H. O. Thomas, of Liverpool. It is only fair to Mr. Thomas, and to those who advocate the protective treatment I have defined, to say that Mr. Thomas did not employ fixation apparatus in the sense employed by American surgeons. He was opposed to the use of plaster-of-Paris or any form of plastic dressing that prevented frequent inspection of the knee. It is true that his splint consisted of a posterior leather trough, on which the limb rested, and to which the knee was secured by means of a roller bandage. From what I saw of his treatment I am sure, however, that he aimed to protect the joint against trauma, and that he aimed to immobilize by means of his posterior trough in the splint and the roller bandage. So that the method, after all, can and should be known as the Thomas treatment.

It has been exceedingly difficult to draw a sharp line of distinction between the three methods already defined. Still, in a general way, we have sufficient data for the following figures: 71 cases are recorded as having been under the expectant treatment, with 3 deaths, 2 of which only were from the disease; 5 came to excision, 3 to amputation, and 60 remained with fair results. In 190 cases the fixation treatment was adopted throughout. Of this number there were 35 deaths, 20 of which were traceable to the disease itself (about 10 per cent.); 9 came to excision, 1 to amputation, and 145 remained with more or less fair results. Only 39 have been subjected to the protective, or Thomas, treatment. Two died from causes in no way connected with the disease itself; 37 remained with good results.

The results in the 60 cases under the expectant plan show that 23 had abscess (38 per cent.), 37 had no abscess. Of the 145 under the fixation plan, there were 63 with abscesses (43 per cent.), 82 without. Of the 37 under the protective plan, 19 (about 50 per cent.) had abscesses,

18 not. This shows a greater proportion of abscess cases among those treated by the protective plan, but it can be easily shown that the majority had abscess before the Thomas treatment was begun.

Analysis as regards motion. Among 23 suppurative cases—cases treated by the expectant plan—14 had motion, 9 were pretty firmly ankylosed. Among those without abscess (37 cases) 30 had motion and 7 were ankylosed.

Under the fixation plan (63 cases), where abscess had occurred, there was motion in 43 instances and ankylosis in 20. Among those without abscess (82 cases), 70 had motion, 12 had no motion.

By the protective plan, where abscess occurred (19 cases), 16 had motion and 3 were ankylosed. Where abscess did not occur (18 cases), all had motion, none were ankylosed.

A *résumé* now would be as follows: Of 60 cases under the expectant plan, 44 (or 60 per cent.) had motion, 16 had no motion. Under the fixation plan, in 145 cases, 113 (76 per cent.) had motion, 32 had no motion. Among those treated by the protective plan, in 37 cases, 34 (95 per cent.) had motion, 3 had no motion.

Briefly, then, this analysis shows that motion was obtained more frequently in those treated by the protection plan. The table will show the percentages, and no further reference will be made to that on this occasion.

Other tables show the amount of motion, and I will only say here that 16 of the cases where abscess occurred presented over 90° of motion, while in those where abscess did not occur 25 could be voluntarily moved over an arc of 90°.

Another table will show the intervals of time elapsing between the last observation and the beginning of the disease. There were, for instance, 6 cases where from twenty to thirty years had elapsed; 7 from fifteen to twenty; 22 from ten to fifteen, and so on.

Relapses. It is interesting to note that relapses are not very frequent. Reference to the tables shows that among the abscess cases only 4 relapses occurred in periods varying from seven to twenty years afterward. Among the non-abscess cases 6 relapsed. The question is often raised, Do not these patients require apparatus of some kind the remainder of their lives? This point has been investigated, and of the abscess cases only 14 (4½ per cent.) are wearing some sort of support; of those where abscess had not occurred, 22 (7 per cent.), making a total of 36 (12 per cent.) out of the 300.

Deformity. Of all the cases, both abscess and non-abscess, whether ankylosed or with motion, 150 presented subluxation of the tibia, against 48 where there was no subluxation. Only 2 of the whole number presented complete luxation. In 183 cases where the condition of the patella was observed, in 124 cases the patella was movable, in 59 there was no motion.

The position of the limb; or, rather, the limit of extension. Reference to my tables here shows that of 227 cases, only 15 got well with deformity at an angle under 135°, and 141 presented an angle of deformity of not less than 165°. This enabled them to walk with their limbs practically straight, and with scarcely an appreciable deformity. To go more into details, 71 could extend their limbs to an angle between 175° and 180°.

By comparing the different methods of treatment, it can be shown, without going into details, that the protective treatment gives the largest percentage of good results, so far as position is concerned, the fixation next, the expectant the smallest percentage.

The length of the condyles. Forty-eight cases have been analyzed with reference to epiphyseal lengthening. To this 48 I am at liberty to add 68 analyzed by Dr. John James Berry, at that time a member of my house staff, who published in the Boston *Medical and Surgical Journal*, many years ago, a paper on "The Growth of Bone in Knee-joint Disease, from Measurements of Ninety-two Cases." Taking, then, for our analysis 116 cases, we find the following:

In 6 cases	. . . . .	1 inch lengthening.
In 15 "	. . . . .	¾ " "
In 34 "	. . . . .	½ " "
In 17 "	. . . . .	¼ " "

Great care was taken, both by Dr. Berry and myself, in securing these measurements. The extreme end of the condyle was found on both sides, a mark made on the skin directly over the end of the condyle, and the two sides carefully compared. This gives us 62 per cent. of the whole number with increased length. A larger percentage of cases occurred among those treated by the protective method.

Among the cases that came to excision (14 in number), an analysis bearing on the deformity and shortening is as follows:

1 was held fixed at an angle of	. . . . .	120°.
1 " " "	. . . . .	150°.
1 " " "	. . . . .	160°.
6 were " " "	. . . . .	170°.
3 only " " "	. . . . .	180°.[1]

2 deformity not known.

In 3 of these the deformity was less than 160°. As to shortening:

1 presented only	. . . . .	½ inch shortening.
1 " "	. . . . .	1½ " "
2 " "	. . . . .	2 " "
1 " "	. . . . .	2½ " "
1 " "	. . . . .	3 " "
1 " "	. . . . .	3½ " "
2 " "	. . . . .	4 " "
1 " "	. . . . .	8 " "

4 not known.

Five of these present still a high degree of sensitiveness over the patella.

[1] That is, perfectly straight.

TABLE I.—NON-ABSCESS CASES WITHOUT MOTION.

Number of years after inception at last observation.	Ankylosed.							Relapse.	Remaining under treatment.			
	105° to 115°	115° to 125°	125° to 135°	135° to 145°	145° to 160°	160° to 170°	170° to 180°		Support only.	Fixation.	P. P. and Thomas	
From 3 to 5 years	...	...	...	...	...	...	...	...	...	...	...	
" 5 " 7 "	...	...	...	...	...	...	...	...	...	...	...	
" 7 " 10 "	...	...	...	2	1	1	1	1	1	1	...	
" 10 " 15 "	...	1	1	2	1	2	...	...	1	...	...	
" 15 " 20 "	1	..	...	1	...	...	...	...	...	...	..	
" 20 " 30 "	...	...	1	...	1	3	...	...	...	...	...	
Total . . .	1	1	2	5	3	6	1	1	2	1	...	
Treatment.								**Total.**	**Sublux ated.**	**Lux- ated.**	**Patella movable**	**Patella fixed.**
Expectant	1	...	2	2	...	2	...	7	7	...	...	7
Fixation	...	1	...	3	3	4	1	12	10	...	...	12
P. P. and Thomas .	...	...	...	...	...	...	...	...	...	...	...	...

TABLE II.—NON-ABSCESS CASES WITH MOTION.

Number of years after inception at last observation.	Degree of extension.							Relapse.	Remaining under treatment.			
	115° to 125°	125° to 135°	135° to 145°	145° to 155°	155° to 165°	165° to 175°	175° to 180°		Support only.	Fixation.	P. P. and Thomas.	
From 3 to 5 years	...	...	...	1	...	6	15	...	...	2	4	
" 5 " 7 "	...	...	...	...	3	5	6	...	...	2	1	
" 7 " 10 "	...	...	3	6	5	5	8	1	1	4	1	
" 10 " 15 "	...	1	...	2	8	8	9	1	1	2	...	
" 15 " 20 "	...	2	2	2	1	5	7	2	1	4	...	
" 20 " 30 "	1	1	1	...	...	3	1	1	1	2	...	
Total . . .	1	4	6	10	17	32	46	5	4	16	6	
Same have following amount of motion.								**Total.**	**Sublux- ated.**	**Lux- ated.**	**Patella movable**	**Patella fixed.**
5° motion	...	1	1	2	...	3	3	10	4	1	3	6
5° to 10 "	...	3	1	...	3	6	3	16	11	1	11	3
10 " 15 "	...	...	1	2	1	4	3	11	8	...	6	1
15 " 25 "	...	...	1	4	1	5	2	13	12	...	12	...
25 " 35 "	...	...	...	2	3	5	4	14	11	...	9	2
35 " 45 "	...	...	1	...	...	2	2	5	1	...	3	...
45 " 60 "	...	...	...	...	1	3	1	5	5	...	5	...
60 " 75 "	1	...	1	1	4	2	1	10	9	...	9	...
75 " 90 "	...	...	...	...	3	3	3	9	4	...	8	...
Beyond 90 "	...	...	...	...	...	..	25	25	4	...	19	1
Treatment.												
Expectant	1	1	1	3	12	8	4	30				
Fixation	...	3	6	6	7	19	28	69				
P. P. and Thomas .	...	...	...	...	...	5	13	18				

TABLE III.—ABSCESS CASES WITHOUT MOTION.

Number of years after inception at last observation.	Ankylosed at							Open sinuses.		Relapse.	Remain under treatm't.		
	105° to 115°	115° to 125°	125° to 135°	135° to 145°	145° to 160°	160° to 170°	170° to 180°	1 to 3	3 to 5		Support only.	Fixation.	P. P. and Thomas
From 3 to 5 years	...	...	...	1	1	2	...	1	...	...	...	1	...
" 5 " 7 "	...	...	1	...	1	2	...	...	...	...	...	..	...
" 7 " 10 "	1	1	2	2	2	1	1	1	...	...	...	1	...
" 10 " 15 "	1	...	1	2	...	2	...	...	1	1	...	...	...
" 15 " 20 "	...	...	1	1	1	1	...	...	...	...	...	...	...
" 20 " 30 "	...	1	...	2	1	...	...	...	...	...	1	...	...
Total . . .	2	2	5	8	6	8	1	2	1	1	1	2	0
Cicatrices.								Total.		Subluxated.	Luxated.	Patella movable	Patella fixed.
1 cicatrice	...	...	...	1	1	2	...	4	...	4	...	...	4
1 to 3 cicatrices	1	...	...	3	3	5	1	13	...	10	1	1	12
3 " 5 "	...	...	...	1	2	2	...	5	...	5	...	...	4
5 " 7 "	...	1	2	1	...	...	...	4	...	4	...	...	3
7 " 10 "	...	1	...	1	1	...	...	3	...	3	...	...	3
10 " 15 "	1	...	...	...	...	...	...	1	...	1	...	...	1
15 " 20 "	...	...	1	...	...	...	...	1	...				
Treatment.													
Expectant . . .	1	1	...	2	4	1	...	9					
Fixation . . .	1	1	4	6	3	4	1	20					
P. P. and Thomas	...	...	...	...	...	...	...	3					

TABLE IV.—ABSCESS CASES WITH MOTION.

Number of years after inception at last observation.	Degree of extension.							Open sinuses.		Relapse.	Remain under treatm't.		
	115° to 125°	125° to 135°	135° to 145°	145° to 155°	155° to 165°	165° to 175°	175° to 180°	1 to 3	3 to 5		Support only.	Fixation.	Thomas.
From 3 to 5 years	...	...	...	1	2	3	4	1	..	...	...	2	1
" 5 " 7 "	...	...	...	...	2	2	4	...	...	...	...	1	1
" 7 " 10 "	...	...	1	1	5	6	8	2	...	1	...	2	3
" 10 " 15 "	1	1	1	2	2	9	6	1	1	1	...	3	...
" 15 " 20 "	...	1	1	1	2	2	...	...	...	1	...	3	...
" 20 " 30 "	...	...	...	2	1	2	1	...	...	...	2	1	...
Total . . .	1	2	3	7	14	24	23	4	1	3	2	12	5
Amount of motion.								Total.		Subluxated.	Luxated.	Patella movable	Patella fixed.
5° motion	...	...	1	3	2	2	1	9	...	7	...	4	4
5° to 10 "	...	...	1	1	1	5	2	10	...	8	...	6	2
10 " 15 "	...	...	1	2	3	3	1	10	...	8	...	5	1
15 " 25 "	1	1	...	...	3	1	1	7	...	5	...	2	5
25 " 35 "	...	...	...	1	4	2	1	8	...	7	...	5	1
35 " 45 "	...	...	...	...	1	2	2	5	...	3	...	5	1
45 " 60 "	...	1	...	...	1	1	...	3	...	3	...	4	
60 " 75 "	...	...	...	...	...	3	2	5	...	3	...	5	
75 " 90 "	...	...	...	...	...	...	1	1	...	...	...	1	
Over 90 "	...	...	...	...	...	2	14	16	...	3	...	13	
Cicatrices.													
1 cicatrix	1	...	1	2	7	3	10	24					
1 to 3 cicatrices	...	1	2	2	4	7	8	24					
3 " 5 "	...	1	...	...	5	5	5	16					
5 " 7 "	...	...	...	2	...	2	1	5					
7 " 10 "	...	...	...	1	2	...	...	3					
10 " 15 "	...	...	...	...	...	1	...	1					
Treatment.													
Expectant . . .	1	...	1	2	3	5	2	14					
Fixation . . .	...	2	3	5	11	10	13	44					
P. P. and Thomas	...	...	...	...	3	4	9	16					

TABLE V.—THIRTY-NINE CASES ANALYZED AS TO MODE AND DURATION OF TREATMENT AND RESULT.

Compared as to Mode and Duration of Treatment.

Length of time treated.	Thomas and fixation.	Fixation.
Less than 3 years	8	8
" " 4 "	2	7
" " 5 "	...	3
" " 7 "	...	5
" " 9 "	...	3
" " 11 "	...	3
Total	10	29

Compared as to Mode of Treatment and Result.

Degree of motion.	Thomas and fixation.	Fixation.
Less than 10°	...	1
Having 10	1	3
" 20	...	2
" 40	...	5
" 60	...	2
" 80	...	3
Over 80	9	13
Total	10	29

It has long since been established that the growth of bone is seriously interfered with by excision, and surgeons, as a rule, avoid operating on the knee-joint. The cases that I have presented lend additional weight to the argument against the operation. The appearance of sinuses, the infiltration and distortion of the limb, seem to demoralize the surgeon at times, and he feels that only an excision will save life.

The tables given are presented without comment further than sufficient to make them clear. It was my intention to supplement the paper by illustrations, but this would make it unusually long.

Table I. refers to the cases wherein no abscess occurred, and where ankylosis has resulted; II., the same class of cases with motion. Table III. relates to abscess cases without motion; IV., abscess cases with motion. Table V. is a comparative table, and may be of interest in fixing more definitely the facts obtained from the analysis above given.

PNEUMONIA OF DELAYED RESOLUTION AND FIBROID PHTHISIS IN CHILDHOOD.

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In Fagge's *Principles and Practice of Medicine* occurs the following passage:

"Addison[1] described certain rare and exceptional cases in which, after an illness of a few weeks, with all the evidences of consolidation present, the patient dies and the lung is found uniformly albuminized. 'The section is not soft, lacerable, and granular as in acute gray hepatization, but smooth, solid, and tough. The alveoli are full of fibrillated lymph, and the exudation cells may have begun to be granular and fatty. It is a condition of the lung very liable to break down, and thus constitute a case of rapid phthisis; and, on the other hand, it is a condition from which recovery may take place and the lung be completely restored.' Wilkes and Moxon,[2] after quoting this account, continue: 'That there is a chronic pneumonia of such a kind can scarcely be denied when it is remembered for how long a time all the signs of consolidation may endure, and then a complete restoration take place. We must, therefore, believe that there is a true chronic pneumonia whose origin is an ordinary inflammation and exudation into the alveoli, and whose appearance is best noted by the term uniform albuminous induration.' They add, however, that such chronic pneumonia may be of the lobular kind, and Addison himself said that this condition may be limited to one or a few lobules only; so that it may, perhaps, be doubted whether this 'least frequent of the permanent pneumonic indurations of the lung' is not, after all, an unusually extensive catarrhal pneumonia."

This communication is to illustrate the fact that similar retarded resolution may be met in childhood, and to narrate cases which are examples of this condition. Further, I shall depict the cirrhotic lung of simple inflammatory type, and its mode of formation from a preceding pneumonia.

According to Fagge, Dürr has recorded, in a volume published by Jürgensen at Tübingen, two cases which occurred in very young children, but in each of which the primary attack appeared to be one of lobar, not catarrhal, pneumonia. *Apropos* of this he says: "Probably, however, the pneumonia which leads to cirrhosis, instead of being lobar is as a rule lobular and catarrhal, secondary to measles or whooping-cough."

[1] Guy's Hospital Reports, 1843, and in the volume of his collected papers published by the New Sydenham Society, p. 27.

[2] Pathological Anatomy, p. 338.

Lobar broncho-pneumonia, however, is very frequent in childhood; moreover, I have already pointed out that the histological difference between croupous and broncho-pneumonia[1] is merely one of degree, that it is not by any means well marked or striking, and that no difference of kind exists in the sense that in one case we have to do exclusively with a croupous inflammation, and in the other with a catarrhal. Nor can such an origin be denied on the ground, held by some, that in catarrhal pneumonia alone the tubes and areolar tissue are invaded with leucocytes. Such an invasion does occur in croupous pneumonia, and the inflammatory condition in children is not by any means necessarily limited to the alveoli.

In pneumonia, when the temperature has fallen to normal, the usual course is for the lung mischief to clear up. Clearance mostly takes about a week, occasionally a little longer, sometimes a day or two, but it may be more prolonged or apparently remain in abeyance.

Resolution is attended by reflux crepitation of moderate-sized râles, more or less marked, which may be detected on the day of the crisis. Sometimes fine crepitations are heard. Again, crepitations may never be present, the consolidation disappearing noiselessly. This, omitting pleuritic effusions, is the usual course of events; but resolution may be so retarded as to raise a suspicion of tuberculosis.

In the first place, it is necessary to realize the great frequency of apical pneumonia in childhood, or a pneumonia invading the root and reaching to the upper lobe and the apex of the lower lobe, and further, to be fully alive to the fact that resolution occasionally occurs tardily, and that sometimes the consolidated mass remains in a state of inertia for days, weeks, or even months. Such a sequence is not sufficiently recognized, and it is in such cases as these that the suspicion previously mentioned may crop up, and a hasty and unfavorable prognosis hazarded. It is to just such cases—like those I am about to relate—that I wish to draw attention, and to impress the desirability of exercising caution before condemning the lung—and, with the lung, the patient.

Before proceeding further, the following clinical illustration may be read with interest:

Case I.—Charles R., aged two years and nine months, was found to have a consolidated left apex on September 20. His temperature was 98° F. He had suffered from cough for a month, and the last week had been much worse.

On the 22d instant it was discovered to be clearing a little. On October 8th there was still consolidation of the lung, with dulness and tubular breathing. The child was much better in general health. On the 11th the lung condition was much improved. Dulness had disap-

[1] "Croupous and Broncho-pneumonia in Children: their Histological Identity." By George Carpenter and W. H. Syers, M A., M.D. Cantab., M.R.C.P. Practitioner, vol. xlvi., No. 6.

peared, though the note was not good. There was no tubular breathing. On November 4th he was discharged quite well.

Case II.—William S., aged twelve months, attended on April 28th with consolidation of the right, upper, and middle lobes. His temperature was 98.4° F. He had suffered from a cough, and had been wasting for five weeks. The child was rickety, and presented an enlargement of the liver and spleen.

In spite of the extreme consolidation, he did not look at all ill. On May 5th there was no change in the physical signs. Scott's ointment was applied over the consolidated area.

On June 2d he was stated to be "getting on beautifully," but that he suffered from a most troublesome cough. He did not make any further attendance.

Case III.—Elizabeth W., aged four years, was seen on January 12th, and found to have a consolidated right apex. Fourteen days previously had taken cold. Her temperature was 101.8° F., and ran up and down until the 28th, when the oscillations became less, up to the 31st, and from that date the temperature varied between 98° F. and 99° F. for the most part, always falling short of 100° F., until she was lost sight of, on March 21st.

On January 27th there was nowhere absolute dulness, but abundant coarse crepitations all over the right chest. Bronchial breathing was heard in the axilla. By February 4th the râles were not so abundant, but otherwise the physical signs were as before. On February 12th she was found to be gaining weight. On the 19th she was taking her food well and making flesh. Her right chest was nearly as resonant as the left. Deficient inspiration and bronchial expiration were detected, accompanied by a few râles only, and those chiefly in front.

She was much better on the 25th and still gaining flesh. There was no actual dulness, but deficient resonance with distant bronchial breathing over the right scapular spine and above the right nipple. Fine, moist râles were detected over the right base up to the angle of the scapula. March 27th she was sent to St. Agatha's Home, Beckenham.

Case IV.—Annie G., aged three years, was seen on December 16th. There was a family history of rheumatism and phthisis. Her illness commenced six weeks previously, and she had been gradually getting worse. There were tubular breathing, dulness, and bronchophony of the left apex. The temperature was then a trifle raised, but fell on the 19th, and remained down all through except during a slight attack of bronchitis and also one of tonsillitis. On December 28th, the resonance, although still diminished very decidedly, was more than before. It was tympanitic where previously the dulness was nearly absolute. Posteriorly, there was very fair respiration in the supraspinous fossa. A note on March 13th recorded that she had gained weight since her admission, but the physical signs in the chest, although varying somewhat from time to time, had not materially changed. There was then almost absolute dulness beneath the left clavicle, and hardly anything to be heard. Posteriorly, there was more resonance than formerly, but very little breathing was detected. The bronchial breathing was much less than when first seen. The question of a localized collection of fluid suggested itself, but she seemed to have so little the matter with her that it was not thought worth while to explore. She was discharged on March 16th. Her mother, who subsequently attended as an out-patient, informed me

that the child remained perfectly well until she caught measles sixteen months later. She had a trifling cough, but never brought up phlegm or blood. Her appetite was excellent, and she was in good condition. Toward the end the child had diarrhœa, some ten or twelve motions a day, and convulsions which lasted two days, and she died some three weeks after the onset of measles.

Case V.—Elizabeth S., aged six months, a congenital syphilitic, was brought on March 31st. Consolidation of the right upper, middle, and part of the lower lobe was found.

On April 3d, reported to have vomited "a deal of phlegm" the day previous. Her temperature was 99.8° F. Tubular breathing was now present at the extreme base. On April 17th she was "a deal better." On May 1st nettlerash made its appearance. As the physical signs remained unaltered, iodide of potassium ointment was ordered for the chest. By June 5th the chest was unaltered and the "cough was very bad." In spite of this, the infant was perfectly lively and bright. On June 30th there was still dulness over the right apex in front and behind, but not extending so far down as before. Tubular breathing and consonating râles were heard over the dull area. Dulness, tubular breathing, and consonating râles were detected over the upper lobe on August 18th. September 8th, the temperature was 101° F., the cause not being apparent. She was gaining flesh. I then took her into the hospital for closer observation, and she was an inmate until the 14th. Her temperature remained subnormal during the whole of this period. On September 18th she was obviously rickety; she looked well enough, however, and was quite bright and lively. The spleen was enlarged a trifle. On October 9th she was much better, but still suffered from urticaria. Her temperature was subnormal, and as far as the mother could judge, she was "in perfect health and getting fatter." The chest condition remained *in statu quo*. An ophthalmoscopic examination gave negative evidence. On November 24 I found a note by my former clinical assistant, Dr. W. H. Millar, to the effect that the right apex was a trifle dull and some crepitations were detected over it. All over the right lung the air entered badly in comparison with the left, and the breath sounds were weak. Extra puerile breath sounds were detected on the left. She was not brought again.

Recently I wrote to the patient's mother and received the following reply: "Our baby died on the 1st of January with convulsions, through being accidentally scalded on the legs."

Case VI.—Jessie S., aged five years and six months, was brought with a consolidated left apex and a temperature of 101.2° F., September 26th. October 3d the temperature was found normal and the physical signs were as before. October 10th she was progressing favorably, had a better appetite, and was improved in every way. The physical signs remained unchanged. She did not attend again.

Case VII.—James D., aged one year and eleven months, was brought with empyema of the left side on March 5th. Four fluid ounces of pus were evacuated, and consolidation of the upper lobe was left after the operation. On May 31st there were still tubular breathing, dulness, bronchophony, and some râles over this area. On June 5th the tube was removed, and on the 19th the resonance was very fair indeed all over, the breath sounds were vesicular and all signs of consolidation had completely disappeared.

CASE VIII.—Ethel M., aged six years, was first seen February 16th. The left upper lobe was solid, the temperature 103.2° F. On February 23d, the temperature was 100° F., the physical signs being as before. On March 5th, temperature was 98.2 F., and there was still consolidation. Dulness and tubular breathing were present on March 10th, but she was bright and lively. On the 23d, the lung was still dull and the breath sounds were of cog-wheel rhythm; but by April 6th the breath sounds were quite free and clear in every respect.

CASE IX.—James C., aged one year and six months, was seen on August 5th. He was said to have been ailing since birth, with his chest. His present illness commenced a month previously with diarrhœa and a cough. On examination, the breathing was loudly tubular at the right apex, back and front, extending down to the angle of the scapula posteriorly. There was deficient expansion, and coarse crepitations were heard below the scapular angle. He died on the 18th.

Post-mortem. The right pleura was adherent in several places. The surface of the right lung, the upper and lower lobes especially, were rough from adhesions. All the lobes were hard and of a dark-red color. The upper sank in water, the lower floated. The left lung and pleura were normal. All the organs were healthy. No tubercles detectable anywhere.

CASE X.—John M.,[1] aged one year and eight months, attended with an empyema on the left side, on October 29th. Seven ounces of pus were evacuated, together with thick pieces of caseating material, the upper lobe being left with signs of consolidation.

On November 5th the upper lobe was still solid, giving dulness and tubular breathing. The tube was discarded on January 25th, and he was sent to a convalescent home on March 9th, cured as regards the empyema. He was again examined on June 23d. The upper lobe was then absolutely dull, with marked tubular breathing, bronchophony and increased cry-fremitus. The resonance was deficient elsewhere in comparison and the entry of air not so good. The breath sounds were vesicular.

On August 9th the chest was of fluid dulness; in the upper axillary region there was deficient entry of air, and distant tubular breathing. An exploratory puncture went into solid lung. Scott's ointment was then ordered to be rubbed into the chest over the affected area, for ten minutes, night and morning.

On August 27th there was a note to the effect that since the commencement of mercurial inunction a marked improvement in the chest signs had taken place. The chest area corresponding to the upper lobe was still deficient in resonance in comparison with the other side, but this resonance was mingled with dulness. Breath sounds were then vesicular over this area; there was fair entry of air, and a few râles to be heard. The remainder of this side of the chest was deficient in resonance in comparison with the other side, but the entry of air was good, though not quite so marked as on the healthy side, and the breath sounds were vesicular. He was sent to Brighton the following day. The students in my class will remember seeing this case in October last, when I narrated his history as well as I could then remember. His chest was perfect as regards physical examination, and, with the exception of an

[1] This case was mentioned in International Clinics, January 1893. Article, "Pleurisy in Childhood," by the author.

adherent scar, there was absolutely nothing left to tell the tale of his former trouble. Consolidation lasted then, for certain, during a period of ten months, and probably did not completely disappear for some weeks, perhaps longer, after that examination.

Both in this case and in Case VII. the quantity of pus was small—far too little to bring about collapse of the apices. Such are merely instances of purulent pleurisy in association with pneumonia—a not at all infrequent starting-point of that disease in childhood.

In *International Clinics* (for January, 1893), when dealing with "Pleurisy in Childhood," I have already expressed my views, in these terms: "Such might pass for apical consolidation, and so it is—usually fibrinous, sometimes due to compression, occasionally tuberculous," which have, unfortunately, owing to a printer's error, been translated into: "Such might pass for apical consolidation, and so it is, usually fibrinous, but occasionally this compresson of the lung by bands of lymph causes tuberculosis"—a statement which, of course, was never intended.

Case XI.—James R., aged twelve months, was first seen on March 11th. He had suffered from cough for six or seven weeks, and had snuffled since birth. His mother had had two miscarriages. His brothers and sisters were syphilitic. About six weeks back he had a "bad chest, was hot, feverish, experienced difficulty in breathing, and suffered from thirst." Three weeks previous "lumps appeared on the hand and wrist." He had consolidation, tubular breathing, dulness, and bronchophony of the left upper lobe and apex of the lower. His rib ends were beaded and the anterior fontanelle one and a half inches long. The spleen was one finger below the costal margin, and his liver could just be felt. There were cutaneous gummata on the left knuckles, and a gumma above the left wrist on the radial aspect, also one above the right wrist, palmar aspect. Temperature 101.6° F., pulse 156, respirations 80. I took him into the hospital, and when there he was found to have green and offensive diarrhœa. On March 30th the following note appears: "The temperature now registers 99.2° F., the pulse is 154, and the respirations 44." The abscesses on the wrist were opened, as they were on the point of bursting. By April 2d he had rapidly lost flesh. The lung was then *in statu quo*. In the afternoon the breathing became labored, the pulse very feeble and irregular, and death supervened. The presence of cutaneous gummata at one time led to the suspicion that this might be an instance of syphilitic disease of the lung; but the complete absence of reaction to treatment, and the large size, considerably modified these ideas.

Post-mortem. There were thin adhesions of the upper, and upper half of the lower lobe on the left side—the lobes were united. The upper lobe and upper part of the lower lobe were of a red color and consolidated. The bronchial tubes were thickened, dilated, and contained pus. Radiating from the bronchial tubes were scars of different sizes passing in various directions, and intersecting the solid areas in varying degrees. The microscope showed a combination of croupous and catarrhal products. Here there were masses of unaltered fibrin; in other situations, fibrinous masses with catarrhal cells; in others, again,

catarrhal cells alone. The bronchial tubes were thickened, and presented more or less catarrhal inflammation. The above lesions were situated for the most part around the bronchial tubes. Some areas were quite healthy. In the areas of consolidation were noted proliferation of the alveolar walls and commencing fibroid changes. On the whole the catarrhal products were in excess of the croupous.

Judging from the shape of some of the alveoli, collapse had occurred. The autopsy further proved that this was a case of phthisis—although not apparent before microscopical examination—occurring in a syphilitic child. The gummata, which behaved somewhat differently to syphilitic gummata, probably owed their origin to a tubercular process.

On more than one occasion I have seen similar lung implication in young children; but here again, although not very marked, naked-eye gray or yellow tubercles were seen sparsely scattered throughout the affected area, leaving no doubt as to the nature of the process.

And here I must pause to say a word or two on syphilitic pneumonia of infants. Cases have been recorded by Greenfield[1]—though in this case there is no positive proof of a syphilitic origin—one aged twelve months, and one by Mr. Charters J. Symonds,[2] aged one month. The former showed consolidation of the right lung of a yellowish-white color, with minute bands of fibrous tissue running through it. The latter where attacked was solid and fleshy. Both showed extreme fibro-nucleated growth and dilated thin-walled capillaries. Still remaining air vesicles were seen with and without epithelial proliferation. Although the child was an obvious congenital syphilitic, the microscope showed that the process was after all a tubercular one. At one time I thought it might be of syphilitic origin. Cases of this condition have also been described by Virchow, Wagner, Robin, and Wilkes and Moxon.

In my experience, cases of retarded resolution in association with pneumonia have been found, with a solitary exception of basic pneumonia, in those showing an apical, or the upper and part of the lower lobe distribution.

Given, then, such a case, its nature and the probable sequence of events have to be determined. It must be borne in mind that fluid in the shape of pus sometimes limits itself to the apex. If the case has been under observation since the commencement, then the gradual dampening of the signs of consolidation would lead to a suspicion of a fluid collection. Bronchophony and tubular breathing, previously well marked, become distant, or a dampened vesicular murmur may take its place; or râles, previously sharp, metallic, and close to the ear, appear now more or less removed. There may be rises of temperature, with nocturnal exacerbations, or this may be raised but little, if at all. The child may or may not appear ill. If such are met with at the first

[1] Trans. Path. Society of London, vol. xxvii. p. 43.
[2] Ibid., vol. xxxvii. p. 124.

examination, the possibility of a localized empyema must be borne in mind. When in doubt, do not hesitate to use the exploring-needle—its passage into a solid lung or cavity will solve the difficulty should any exist. This being negatived, is the consolidation of a simple nature, or does it owe its origin to a tubercular parentage?

Continued rises of temperature, night-sweating, wasting, gurgling râles, progressive invasion of the lung, and the attachment of the fellow-apex, are in favor of phthisis. But the opposite lung may show no signs, and the gurgling râles may be merely an evidence of dilated tubes. Sometimes the difficulties are very great, and only to be solved in the dead-house. But inasmuch as tubercular affections in young children are so often of the generalized rather than the localized variety, the presence of other tubercular evidence must be remembered, viz., abdominal symptoms,[1] brain disturbances, tubercles in the choroid,[2] tubercular cutaneous lesions, testicular implication,[3] joint affections, and the like.

The fact that the consolidation remains *in statu quo;* that the particular signs referable to that condition persist, without much if any alteration; that the temperature remains normal; that the child, apart from auscultatory evidence, keeps well, both in mind and body, with obvious improvement in the general health, as gauged by appearance, increase of weight, and the mental condition, are all in favor of a simple consolidation of retarded resolution, whose final disappearance may or may not be heralded by crepitations. Time is all that is necessary, and time will clear up the nature of the disease. But in such cases as these an insidious fibrosis may be in motion—a fibrosis which, in some instances may be slight and but little progressive, or may pass on into a wide and far-reaching cirrhosis of the lung, with obliteration of its alveoli and general and extensive shrinkage of its bulk. Such a condition may or may not be associated with dilated tubes. Occasionally one sees in the post-mortem room slight scarring of a lung otherwise healthy, and it is just this scarring which may be a remnant of the condition previously mentioned, the branding of the organ, as it were, with the history of its former troubles. Such cirrhoses may be of a simple inflammatory nature, and it is with these that I am now dealing, or they may owe their origin to a tubercular process.

Tubercular fibroses are seen in children, and in the majority of instances are easily recognized as such; but in others the microscope is required for their definition and detection, and as an illustration of this I have narrated the case of J. R. If a microscopical examination had

[1] "Tubercular Peritonitis, its Natural History and Treatment," by James F. Goodhart, M.D., F.R.C.P., and the author.

[2] "Tuberculosis of the Choroid," by the author; Illustrated Medical News, December 7 and 14, 1889, plates; Graduation Thesis, plates; British Medical Journal, 1890, plates.

[3] "Affections of the Testicles in Hereditary Syphilis," by the author, Practitioner, 1892.

not been made, this lung, as far as outward appearances went, might have been readily passed into the group of simple cases.

Weber has narrated the cases of three children in whom the disease took origin in a croupous pneumonia, for which complaint he originally treated them.

In adults, such an onset has been occasionally observed. In a case of Charcot's,[1] death occurred three and one-half months after the onset of the acute disease, and the pathological changes were marked. A case of Osler's[2] died a month after the onset of the chill. The lung was uniformly solid and grayish in color. Some of the fibrin plugs were undergoing fatty degeneration, others fibroid organization, with great thickening of the alveolar walls. It was so in a young child under my care.[3] Cases are on record by Mayne,[4] by Coupland and Goodhart,[5] and Greene[6] has met with two cases in which the intra-alveolar exudation products were undergoing fibroid development. Wilson Fox insisted that bronchial dilatation is favorable to an indurative pneumonic process. Bronchial dilatation and peri-bronchitis are frequently met with in bronchitis or broncho-pneumonia, but only as part and parcel of the disease—of the same morbid inflammatory action.

Bronchial dilatation *per se*, in my opinion, is no more capable of inducing lung fibrosis than inflammatory lung mischief without bronchial attachment is competent to cause dilated tubes. As an illustration of instances of cirrhosis of the lung, I quote the following cases, proceeding then to discuss the methods of detection of this malady, and other details which have not been already gathered in the course of their narration.

Case XII.—Isabel H.,[7] aged five years, was admitted on September 9, 1892. Her family history was negative. She had always been well until August, 1891, when she had pertussis, followed by measles and pneumonia in November, 1891. In July, 1892, she had a bad cough, with yellow expectoration streaked with blood, and was treated for this as an out-patient. She now has night-sweats and has wasted.

On admission, there was dulness all over the front of the left chest and behind up to the spine of the scapula. The breath sounds were deficient all over the front of the chest and behind, from the base to the level of the scapular spine. Distant tubular breathing, with a few crepitations, were heard. Above the spine of the scapula the breathing was loud and tubular, with râles. Cardiac impulse (?) displaced upward internal to the nipple. This supposed upward displacement

[1] Thèse de Paris.

[2] Principles and Practice of Medicine, 1892.

[3] "Croupous and Broncho-Pneumonia in Children, their Histological Identity." Practitioner, vol. xlvi., No. 6, p. 433.

[4] Dublin Hospital Gazette, May, 1857.

[5] Trans. Path. Soc. London, vol. xxv. p. 33.

[6] Pathology and Morbid Anatomy, 6th ed., p. 423.

[7] International Clinics, January, 1893, "Pleurisy in Childhood," by the author.

was probably uncovering of the organ. Temperature 99° F. Respirations 48. Pulse 120. The case was thought to be one of empyema by the resident medical officer. The physical signs were identical; but it will be noticed that the heart was not displaced, a most important guide. Soon after admission an exploratory puncture was made in the eighth space, in the posterior axillary line, and about ten minims of pus mixed with air withdrawn. The child coughed after the needle was inserted, blood began to pour from her mouth and nostrils, and she died asphyxated.

Post-mortem. The pericardium was hardly covered by the left lung at all.

Larynx: Full of frothy blood-stained mucus.

Bronchi: Full of blood-stained mucus, which extended on the right side as far as the medium-sized bronchi, and on the left into the smallest.

Right lung: Normal. Recent adhesions to thoracic pleura.

Stomach: Full of blood; a little blood in the duodenum. No sign of tubercle anywhere.

Left lung: This was small, showing a combination of cirrhosis, consolidation and induration of the lung tissue. The bronchial tubes were dilated and thickened, with scars radiating from them in all directions, and passing into cirrhotic, consolidated or indurated areas. Microscopically, these tubes showed an absence of mucous membrane. The basement membrane was infiltrated with leucocytes, and peri-bronchial infiltration was marked. Peri-bronchial, peri-vascular, and septal thickening were marked, the number of nuclei seen being variable. By these far-reaching fibroses the lung tissue proper was greatly curtailed. The bronchial walls, thickened and irregular in outline, look as if made up of granulation tissue. The changes in the alveolar walls themselves are various, from (though rarely) an absence of alteration to a most intense fibro-nuclear or fibroid induration, in which latter case whole areas are destroyed. The new tissue is exceedingly vascular. These changes appear to spread centrifugally from a small vessel or a bronchiole. The pleura is vascular and thickened, though but little. The alveoli show occasional very large granular cells with single nuclei. More frequently are seen catarrhal cells, or cells approaching leucocytes in appearance, or a combination of these elements. When the alveoli are much pressed up by fibrosis the catarrhal contents appear like a cubical epithelial lining. Further, some show an intra-alveolar material of varying size, which may or may not be stained fibrin masses with nuclei in them. Some show rifts, and others a certain fibrin-like network. The catarrhal cells do not seem to lend themselves to the new growth. They are there seemingly in a passive rather than an active condition, as far as fibrosis is concerned; nor can any organization of the fibrin be detected. Moreover, in some of the specimens they are very few and far between.

External to a large bronchial tube appears a tiny round-celled neoplasm, which seems to be undergoing fatty degeneration in the centre.

CASE XIII.—Catherine W., aged eight years, was kindly sent me by my friend, Dr. Hector Mackenzie, in December, 1892. Three years ago she suffered from whooping-cough. Her present illness "dated nineteen months back, with a hacking cough, worse in the morning." In February, 1892, she caught a fresh cold, and was kept in bed for two

or three weeks, when she was transferred to the Brompton Hospital, where she remained three and a half months. At this time her cough became worse; but during her stay in hospital she derived considerable benefit.

Her father died of "inflammation of the lungs and pleurisy," and was ill one month. Two paternal uncles are said to have died from consumption.

Her mother expressed surprise at the child "seeming so well," and considered the "only trouble was the cough." She sweats a little at night occasionally, and expectorates about a quarter of a teacupful of yellowish offensive material three times a day, and generally after meals, after which she seems better. The matter is faintly streaked with blood. When she lies down at night she "feels a sensation of sickness," and then without any great amount of coughing or straining she brings up about one ounce of thickish, curdy pus. At odd intervals during the day she is troubled with a slight hacking cough.

Examination. The chest on the left side is considerably shrunken, and moves but little. The *cardiac impulse* is heaving in the anterior axillary line, in the sixth and seventh interspace. Over this impulse the sounds are normal. Above the nipple the first sound has a cantering rhythm, and there is a doubtful bruit in it of presystolic and systolic time. Attending this is a presystolic and systolic thrill. Over the infraspinatus muscle the heart sounds are loud and ringing.

The left side of the chest is uniformly dull from apex to base, and this dulness extends to within a finger's breadth of the left of the sternum. In front there are coarse bubbling râles, with coarse respiratory murmur, and behind, loud, tubular breathing from the apex to the eighth rib, as far forward as the posterior axillary fold. Below, the respiratory murmur is deficient, and the râles are smaller. On the right side the breath sounds are extra-puerile. The lung is hypertrophied, and extends well to the left of the left margin of the sternum. The sputum was examined for tubercle bacilli, but none were detected. The organs were normal, and there was no clubbing of the fingers and toes.

Case XIV.—Amos D., aged seven years, was said to have had no illnesses up to July, but then he "caught a cold," at a school treat, which was followed by pneumonia, and ever since he had been ailing. In the middle of January following he came under my care. There was no history of syphilis, nor was there any phthisis in the family.

On admission he was found to be an emaciated, feeble child, with clubbed fingers. Respirations 50 to the minute, pulse 125, and temperature 99.6° F.

The cardiac impulse was in the fifth interspace diffused, but most marked in the nipple line. There was also an epigastric impulse. The area of dulness was well to the right of the sternum. The left chest gave tympanitic resonance in front above the third rib, and the breath sounds were vesicular. Below this dampened tubular breathing and weakened vesicular murmur were detected. Behind, in the supraspinous fossa were vesicular breath sounds; below, over the middle third or more, there was tubular breathing of an echoing quality, and below this again the breath sounds were dampened. The whole chest behind was dull. Over the opposite side the breath sounds were extra-puerile. The left chest was considerably shrunken, and there was marked com-

pensatory lateral curvature. The urine was free from albumin. He suffered from troublesome cough, but there was but little expectoration. No tubercle bacilli. During the time he was under observation the physical signs changed from time to time. Thus, on one occasion, in the lower half, behind, and all over the front, with absence of cardiac dulness there was tympanitic resonance (stomach), and even whilst under examination the lung again became dull. Sometimes consonating râles were to be heard. On admission, the resident medical officer, suspecting pus, made an exploratory puncture in the ninth interspace, withdrawing a syringeful; but this was evidently from tapping a dilated tube.

Cirrhosis of the lungs is not so very uncommon in childhood. The chief signs and symptoms have been gathered by a study of the cases I have narrated. Retraction of the chest and compensatory lateral curvature may be but trifling. Thus, enormous dilated tubes may take up the portions of lung tissue, or the void left by a contracted lung relic may be filled up by an amyloid liver. Nor are dilated tubes invariably met with in cirrhotic lungs. Any portion of a lung may be attacked —the apex, the base, or both; usually, perhaps, the base when a single lobe is invaded.

In the case of implication of a single lobe there is no retraction of the chest, and the physical signs are those of consolidation, with consonating râles if there be any pus in the tubes, or gurgling râles if they be considerably dilated. There may be, with dulness, merely deficient entry of air without râles, or a few bronchitic signs.

Tubular or hollow breathing will depend upon the laryngeal intonation, and the latter may or may not denote dilated tubes. With one mode of respiration, the physical signs are those of fluid, with another the tubular character becomes apparent. The position of the heart is important. In left-sided lesions the organ may be uncovered, exposing a large portion, or the whole of its surface, with consequent diffusion of the impulse; or contracting adhesions with the lung, the heart may be displaced. Thus, if the right lung is attacked, the heart may be seen beating at the right nipple; if the left, pulsation may be detected up toward the left clavicle. Possibly anomalous murmurs from anatomical displacements, or a thrill, mayhap, may make their appearance. As time goes on, and as the fellow hypertrophied lung fails, the right side of the heart dilates, the fingers club, and the changes in the organs met with in this condition then make their appearance and stamp the case as one of secondary heart disease.

Prior to this, however, from the continual suppuration going on in the tubes, lardaceous changes in the viscera may occur, and the case become one of lardaceous disease. *Per se*, this condition of the lung gives rise, to commence with, to no particular symptoms, but the malady is detected by physical examination. The child may be fat rather than

the reverse, and apart from shortness of breath on exertion there may not be apparently much the matter with him.

Such is his condition during the warm weather, but on the advent of cold or adverse climatic influences, bronchitis or broncho-pneumonia make their appearance, and the child shows the symptoms and physical signs of these diseases, and wasting takes place.

This condition has to be separated from chronic pleurisy with effusion; for, as regards auscultatory signs, there may be but little to choose between them; thus dulness of fluid character, impaired or nearly absent vesicular murmur, with a few bronchitic signs, may be the order of the day, or there may be distant tubular or hollow breathing. As far as these signs go, to make a definite decision would be an impossibility.

With a cirrhosed lung and a vesicular murmur, this is conducted from the healthy side. Occasionally one has an opportunity of observing the solution of such a phenomenon at an autopsy.

The position of the cardiac impulse, and the positive or negative results obtained from one or more exploratory punctures, should determine as to its nature. That such a puncture is not without danger in cirrhotic cases has been amply demonstrated by the case I have narrated. Further, it must be borne in mind that a dry tapping does not of necessity mean absence of fluid. The behavior of the needle after its passage through the chest-wall, whether into a cavity or solid lung, must be carefully noted. Further, the withdrawal of pus does not mean of necessity free pus in the pleural cavity; the pus may come from a dilated tube, or what not. The use of this instrument in an intelligent in contradistinction to a perfunctory manner should prove of the utmost assistance.

Further, this disease has to be separated from an invasion of new growth in the lung. Attention directed to the mediastinum, which is almost always attacked, should prevent any difficulty in this direction.

Sometimes ulceration of the dilated tubes takes place, and then, with offensive purulent sputa, a hectic temperature, and severe wasting, the child rapidly passes down hill. A microscopical examination of the sputa will in these cases reveal yellow elastic tissue. The sputa will not contain tubercle bacilli. Of course, however, it is quite possible, and highly probable in some cases, that tubercular infection has taken place secondarily, though the possibility of tuberculosis being the *fons et origo mali* must be well borne in mind. If such were the case, it is highly probable, though of course not absolutely certain, that the fellow lung in advanced disease would commence to show signs of implication.

From pneumonia of delayed resolution to fibroid pneumonia there is, as I have shown, a wide gap; and yet, not so wide after all, in some instances. Much will depend upon individual cases, and it is by no

means an easy question to foretell the probable, or perhaps rather the possible, course of any consolidation.

That a consolidation can remain in abeyance for very many months, and then finally clear to physical signs, is a fact of very great importance indeed, and should at least teach the lesson of not too hastily jumping to a conclusion. On the other hand, in some cases, a few weeks alone have been found necessary to bring about any decided fibrosis of the organ. The pneumonia of delayed resolution is, *per se*, not dangerous; it becomes so if resolution does not come to its assistance. In such cases, as far as my own experience goes, the rubbing in of Scott's ointment, or some other mercurial ointment, has appeared to me a remedy of very considerable value. It has roused the dormant activity of the parts and has been attended by results of an encouraging nature. At this stage it is obvious that the line of treatment must be directed to the induction of such a desirable termination. There is no doubt that the longer the powers of resolution are deficient, the greater is the danger of a smouldering, though terribly destructive process going on. In addition, the general health must be improved in every way by tonics; iodide of potassium internally, good feeding, and change of air. For the latter, Newquay, in Cornwall, is an ideal resort. I do not confine patients to their beds under such circumstances. Full expansion of the lungs should be invited by gentle exercise, short of fatigue and of exposure to east winds and to damp and wet.

With a fibroid lung, all remedies must of necessity be palliative rather than curative. But much can be done even here, by placing the patient under suitable hygienic conditions. Thus cold, damp, and wet are to be avoided absolutely. Residence in a warm and equable climate, such as Ilfracombe, Torquay, the south of France, or Egypt, will at least make life endurable, and prevent the advent of bronchitic or broncho-pneumonic attacks, which are terribly frequent and harassing under adverse circumstances.

Tonics, suitable clothing, and good food, must be chiefly relied upon. With fair general health there is much less liability to bronchitic attacks. Acute attacks must be dealt with on the usual lines. With bronchorrhœa, inhalations of carbolic acid, creasote, iodine, and turpentine may be used with advantage, and the latter may be administered internally. Excessive coughing must be alleviated by opiates and chloral, and indications of cardiac failure combated by the usual remedies.

ON THE COURSE AND TREATMENT OF CERTAIN URÆMIC SYMPTOMS.

By Beverley Robinson, M.D.,
of New York.

In beginning my paper I wish to say that I am in doubt as to the title of it. In some respects I would prefer to use the designation "symptoms of renal insufficiency, or inadequacy" rather than "uræmic symptoms." I make this statement because *uræmia* does not satisfactorily express, as we all know, our belief to-day in regard to the precise etiology of many cases in which the kidneys are no doubt at fault primarily or secondarily. If, however, I employ the designation *renal insufficiency*, I feel that exception may be taken to the title, as I shall speak of cases in which the kidney is surely affected with well-defined structural changes, and the term uræmia, as it is generally received, implies this belief in the majority of instances.

In my daily routine, especially of private practice, I meet with cases of the kind I shall at first try to describe, and with which doubtless you are more or less familiar. The patients to whom I refer are, as a rule, what are called healthy, *i. e.*, they have no distinctly marked organic changes which are discoverable in their different organs; or these changes are so slight in amount that I cannot fairly attribute major importance to the state of one organ as compared with others, without the most careful analysis of all the conditions involved. Such patients, however, have habitually some little bodily annoyances which fret them more or less, and from which they desire to be relieved, and they naturally seek, sooner or later, the physician's care. In regarding these patients at present, I am satisfied that many of them suffer primarily from slight renal disorder. This affection of the kidneys, mainly functional, is at times more pronounced, and occasions symptoms which hitherto we have considered under the term uræmic.

In the mildest forms of the trouble, I believe renal insufficiency is a more appropriate term, particularly if we limit its proper significance. I am aware that the term itself is frequently employed in descriptions of uræmia, although I have not found an article or chapter in which the epithet was used as the *title* of a recognized condition. By adopting this name with this purpose, we shall be able hereafter to employ it to cover a definite series of symptoms, which, in my judgment, are not otherwise properly designated.

I will now narrate a few cases in my later professional experience which shall serve as a text to explain my position.

Case I.—A lawyer; widower; fifty-five years old; a man of large frame, who has enjoyed excellent health. In the winter months he

suffers from nasal obstruction and formation of excess of mucus in the naso-pharyngeal space, which he relieves by efforts of hawking. Patient has a somewhat constipated habit, and his urine is often higher colored than is normal. Frequently, however, the density and color are normal. It contains at these times no abnormal ingredient. Whenever the density increases and the color is darker, there is a heavy deposit of pink urates; but there is no albumin, no sugar, and rarely, if ever, any casts. The quantity of urine voided, as a rule, approximates the normal. When the color becomes dark and the density increases, the quantity diminishes, but not usually to any great extent. The patient under the latter circumstances suffers from general neuralgic manifestations, mild in form, and which rapidly disappear under judicious medical management. Appetite is excellent; no dyspeptic symptoms ordinarily; lives well, but commits no excesses. Very moderate in the use of wines or distilled liquors. No attacks of rheumatism or gout. He finds himself much better in health when he eschews sweets and butchers' meat; feels more buoyant and in better shape when his meals consist mainly of vegetables, and particularly rice, and when he eats white meats, fresh fish, and eggs. On several occasions, I have attended him professionally, when, without knowledge of the precise cause of his attack, he has had sneezing and running of the nose; little or no fever; slight cough; no evidences of stomachal derangement, and yet he was evidently torpid or sluggish and complained of marked drowsiness. The urine at these times was dark-colored and loaded with urates. A mercurial, followed by a brisk saline purge, on two successive days, rest in the house, the free use of natural Vichy water, and very light diet, cured these manifestations of disordered function, and in a few days he resumed his occupation and was as well as previously.

Case II.—A broker; forty-two years old; married; thin and spare; of an energetic, resolute character; states that several years ago he passed a small mulberry calculus, but previous and subsequent to this attack has had no disease for many years. His urine is habitually somewhat high-colored, otherwise normal; his intestinal digestion is imperfect; he is somewhat constipated at times; again he has two movements in the twenty-four hours, which are formed, but not as large as would seem to be healthful, due regard being had to the amount he eats. His diet is varied, abundant, but not excessive. He drinks wine moderately; he smokes, but not to excess. He is often annoyed with vague pains in his abdomen which extend into the lumbar region. These pains are not severe as a rule, and usually are merely uncomfortable sensations. His abdomen is perhaps slightly distended and tense, but he is scarcely annoyed with flatus. The epigastrium is somewhat tender on pressure, as also, occasionally, are other regions of the abdominal cavity. There is no manifest stomachal dyspepsia. The vague abdominal pains come at irregular intervals during the day, last a variable time, and disappear quite suddenly. Patient is rendered irritable and somewhat morbid by reason of his abdominal condition. He is also conscious of a slight laryngeal irritation which obliges him to expectorate a small quantity of viscid phlegm occasionally. His tongue is broad, slightly coated on the dorsum; his skin is sallow; his liver is not enlarged. Strict regulation of the diet, as in the previous case, the regular use of euonymin, podophyllin, or cascara, persistent drinking of Giesshübler or Vals water, have ameliorated but not cured my patient.

Latterly, I have prescribed salicylate of bismuth in addition to what precedes, with the hope that intestinal antisepsis thus produced would be effective in controlling the symptoms of functional disturbance which I have outlined and which I have been led to believe were caused by renal insufficiency.

CASE III.—Only a few weeks since I was called suddenly to see a near and dear relative who had been attacked with alarming symptoms of obstinate nausea and vomiting, marked cardiac weakness, and with but few or no evidences in the urine, except just before the fatal termination, of renal complication: at this time a small quantity of albumin and hyaline casts were discovered. The patient was fifty-eight years old, the manager of important railroad lines. He had always been remarkably strong and active. Owing to great irregularity of meals and the immoderate use of tobacco and whisky, he was a sufferer frequently from flatulent dyspepsia, which he relieved with large doses of bicarbonate of soda. Some weeks previous to his death he had an attack of pneumonia, moderate in severity. From this attack he had nearly recovered, when, by reason of over-fatigue, anxiety, and exposure, a mild invasion of acute articular rheumatism developed. The fever had disappeared and he was almost convalescent from this disease when, owing to the immediate effects of a cold bath, the final symptoms occurred, and were regarded by the family physician as evidences of Bright's disease. When I saw the patient I thought the kidneys were congested, but secondarily to the action of a weakened heart, and were connected with engorgement of the other viscera under a similar dependence. This was eminently true of the lungs and liver. No doubt it was the giving way, functionally, of several important organs, that was the cause of death. Whilst this is true, it is also highly probable that the condition of the kidneys, which had become more and more insufficient, gave the terminal features of the combined conditions, to a greater degree than any other of the organs involved.

CASE IV.—A broker; bachelor; thirty years old; of a nervous, excitable temperament; suffers somewhat from symptoms of flatulent dyspepsia and irritable heart. His bowels are frequently torpid; his urine habitually slightly high-colored. Habits are temperate—drinks little; does not smoke. No gout or rheumatism. After an elaborate dinner at which he drank different wines—but not to the point of inebriety—he went home and slept. In the early morning he had repeated attacks of vomiting and diarrhœa. Accompanying these symptoms there was moderate headache and annoying palpitations. His pulse was rapid, weak, depressible, and irregular. His heart action was also much disturbed; it was rapid, irregular, and the impulse weakened. There was a soft systolic bruit accompanying the second sound over the pulmonary area. Apparently the cardiac cavities were somewhat dilated. The tongue was clean and yet nausea was distressing. No tenderness over the epigastrium or anywhere in the abdominal cavity. The urine had been smaller in quantity since the night previous, and instead of being dark in color, was very light. Under the use, first, of ammonia and bismuth, with broths, milk, Vichy, and rest in bed, he improved rapidly. His heart grew stronger; his urine became more concentrated and larger in quantity.

When the first symptoms disappeared, strophanthus and nux vomica were added to the previous treatment.

Such cases as the foregoing may be differently designated, I am quite aware, and at times are considered of little moment and scarcely worthy of very careful consideration. I have known many such attacks regarded as the usual outcome of excesses of the table, and put down in the broad category of a bilious attack. In one sense they are, without doubt, if we mean by that to express the idea that the liver is incidentally interfered with as to its physiological function; but while this may be true, I claim *now* that such cases are correctly interpreted in recognizing that the kidneys, by their temporary insufficiency, occasion most of the symptoms reported, in a very direct manner. It is also evident that strengthening the cardiac contractions and giving more vascular tone to the general circulation will be found useful. These indications may indeed be urgent. Is it not obvious, however, that it is the retention in the economy of the waste substances, made suddenly enormous by reason of dietary indiscretion, which brings on the threatening symptoms, which require relief by all rational methods? Nature makes every effort in these cases, by frequently repeated vomiting and purging, to clear the body, through these natural emunctories, of the poisonous fermenting ingesta which enter so largely as a factor in the direct causation of such explosions. The rest in bed; the gentle and continuous warmth to the surface; the liquid diet, which is the most rational diuretic as well as food, the quieting effect of the ammonia and bismuth on the irritated stomachal mucous membrane, and the stimulating influence of the former in relieving general depression, were rapidly followed by beneficial effects. As soon as practicable the heart was strengthened and regulated to overcome the effects of diminished arterial tension throughout the body, but particularly in the kidneys, whose functions should be re-established in order to restore equilibrium to the economy.

Case V.—A maiden lady, forty-five years old, thin and spare of body, passed her menopause without functional disturbances; she has always been healthy and vigorous; has a good appetite and digestion; bowels regular; heart action normal; no malaria, rheumatism, or gout. Patient suffers from obstinate, recurrent headaches every morning. After she awakens, gets her coffee and a light breakfast, they frequently disappear, or become less intense. At times they continue during many hours of the day, and only disappear, completely, without apparent cause, to return again the following morning. The urine is normal in quantity, rather light in color, containing no abnormal substances. In this case there was no cardiac hypertrophy and no increased vascular tension—at least, neither one nor the other could be affirmed after careful examination. Almost every rational explanation of the headaches was attempted, and on each occasion followed up by appropriate treatment of the supposed cause, without beneficial effect. Finally, I thought that imperfect elimination of the products of mal-assimilation through kidneys functionally insufficient, and which possibly were affected with the precursory stage of interstitial nephritis, might account for the headaches. Thereupon I prescribed nitroglycerin in the ordi-

nary dose of one minim of a one per cent. solution every four hours, and very soon the headaches were relieved, if not cured. I now felt tolerably sure that my interpretation of the case was correct.

I might multiply examples of different kinds pointing to what I would call insufficiency of renal excretion, with many minute details, but this narrative would merely prove wearisome.

In many instances of obstinate nasal, naso-pharyngeal, laryngeal, and tracheal inflammation, chronic in type, I am now firmly convinced that the inactive functional condition of the kidneys is the primary cause of these inflammations. An imperfect blood-supply, containing in it many elements which should be eliminated through the kidneys, is rendered a source of morbid manifestations in the whole mucous tract—sometimes of the respiratory organs, sometimes of the organs of digestion and assimilation. Doubtless, also, the renal congestion which originates, as it were, this vicious circle is heightened and made more intense by the blood loaded with excrementitious substances, which come to the kidneys continuously, and which, provisionally, they are unable to get rid of. In such cases I have often found, after the bowels had been freely moved, and the mucous linings capable of being reached with suitable topical applications had been treated, that a diuretic solution, such as the liquor ammonii acetatis, frequently given, produced the happiest results after it had been taken during several days in a regular manner.

I have noticed the preceding conditions on several occasions follow bad colds, of the nature of grippe, or attack of influenza, and in these instances have assumed that the specific nature of the disorder of the respiratory tract and general system had much to do with the evidences later on of renal insufficiency. In other cases, in which there could be no doubt, to my mind, that there were organic changes in the kidneys of the nature of chronic parenchymatous or interstitial nephritis, by reason of the specific gravity of the urine, the deposit of albumin frequently contained in it, and the frequency with which different kinds of tube-casts were found on microscopical examination, I have found the symptoms referred to in the cases reported, but seemingly of graver significance, because they were united with manifest organic renal changes. Almost invariably, as we know, all undue fatigue, intense emotional excitement, errors of diet or drink, cold and exposure, will aggravate renal disease and bring on, rapidly or slowly, disquieting symptoms. Knowing the previous condition of the kidneys, we can never prudently ignore this knowledge when we care for such patients.

Case VI.—A distinguished architect of New York has been one of my patients, off and on, for at least eighteen years—indeed, during nearly all my professional life. This gentleman, now over sixty years of age, is a man of great industry, great talents, and remarkable professional success. Once or twice in the course of every year he has an

acute gouty attack affecting the metatarso-phalangeal joint of the big toe of one or the other foot. Sometimes these gouty attacks in the small joints of the feet come on without premonition; sometimes a bronchial or slightly asthmatic attack precedes them. During the whole period I have taken care of this patient he has had urine light in color, of low specific gravity, containing a variable quantity of albumin and some granular and hyaline casts. Whenever these bronchial, or, frankly speaking, gouty attacks are upon him, and in view of my knowledge of the condition of his kidneys, I am always very solicitous in regard to their outcome. I have seen him when the thoracic oppression was very intense, the heart beating irregularly, rapidly, and feebly, and the pallor and pinched expression of the face were striking and alarming. Accompanying this condition there were disseminated moist and sonorous râles in the chest, and the urine looked almost watery, and was diminished notably in quantity. Under these circumstances I have found that repeated doses of colchicine and the free use of Friedrichshall water were the most useful medicinal remedies to employ. Rest in bed and fluid diet were insisted upon, and in some instances counter-irritation or revulsion to the back was deemed advisable. Subsequent to such attacks, giving up businesss affairs and travel were strongly favored, and when indulged in, rapidly brought about a state of well-being and the return to usual conditions.

In the evident gouty cases, and particularly in those where the heart-action is good and the tension in the arteries not excessive, colchicine is a more valuable remedy than nitroglycerin. In instances, on the contrary, in which the arterial tension is well marked or excessive and the heart laboring, whilst the quantity of urine is small and low in specific gravity, I believe it is wise to begin treatment with nitroglycerin or the nitrites. In any very alarming expression of this condition, inhalations of nitrite of amyl should first be employed. We shall sometimes be disappointed in the efficacy of these agents, and it is, I believe, whenever we have been committed to the error of believing that there is hyper-tension in the peripheral arterial system, connected or not with spasm in the vessels of the kidneys, or some other important viscus. Frequently, the so-called increased arterial tension is merely the consequence of atheromatous thickening of vascular walls, and the blood, instead of being under too great pressure, requires increase of the *vis a tergo* to make it circulate more freely and with greater energy. This may often be attained by the use of caffein or digitalis, and as a result of the effective use of one or both of these remedies, we are forced to conclude that the renal phenomena proceed directly from an enfeebled heart, and the true way of managing such cases is really not to make so direct an appeal to the kidneys, in the first place, but rather to the muscular heart-structure. In strengthening the latter we help the former in a much more obvious and important manner. When, however, we are not quite sure to what extent the kidneys originate the series of pathological events and also tend to keep them up, it is judi-

cious to watch very carefully the administration of digitalis. I am convinced that whenever the renal function is markedly insufficient and the urine is greatly diminished, or perhaps wholly suppressed, we are liable to have those curious phenomena in the heart-beats and in the pulse, not to speak of nausea and vomiting, which show accumulation of this drug and its poisonous effects upon the economy. In many instances it is relatively simple to distingush, in a differential way, the part played by the two conditions relative to cause and effect. In others, we are left in great and reasonable doubt, and our judgment in the matter remains most uncertain.

In regard to the simple question of the amount of arterial tension in the radial arteries, I know of nothing more difficult at times than to accurately estimate it—one reason being, besides the one already given, the amount of soft tissues about the artery at the wrist. Even with the use of the sphygmograph we may be unable to decide the matter, for the simple reason that tracings with this instrument are only valuable when made by an expert. Otherwise, we are liable to run into very great errors of interpretation. This is mainly due to the fact that it is very difficult to fit the instrument on any wrist so that we can form a perfect estimate of the directness and accuracy of its pressure over the artery.

Case VII.—A widow, of large bulky frame, about sixty years of age; takes very little exercise, but drives a great deal and lives most of the time in the open air, in summer at Newport, in winter at Cannes. She is careful with her diet, as a rule, but commits occasional imprudences in eating rich or sweet food; almost invariably she pays the penalty of these errors by nausea, stomachal distress, pallor, and a subicteric hue of the skin. The pulse becomes weak, rapid, and depressible, the heart action fluttering and feeble; sometimes the bowels are torpid; sometimes there is and has been more or less diarrhœa, amounting to several loose movements in the twenty-four hours. I have known the attacks once or twice to be of a different kind: instead of the previous symptoms, the head ached intensely; there was torpor and somnolence; the speech was thick, the ideas came sluggishly; the face was somewhat drawn down on one side; the pupils were contracted, and there was more or less nervous irritability, as shown by slight fibrillary muscular twitchings. Seven or eight years ago, at the period of these latter symptoms, the urine was ordinarily of low specific gravity, moderate or abundant in amount, and containing a small quantity of albumin and granular casts. Although the patient had been told that her condition was gouty, and this was true in a certain sense, yet she had never had either a frankly determined attack of gout or rheumatism. Compound cathartic pills, strophanthus, digitalis, and nitroglycerin have all been useful at times, and singular to say, the use of Warburg's extract has sometimes enabled me to be of the most manifest benefit, when the other agents completely failed. I suspected, therefore, very strongly, a malarial element, without, however, being able confidently to affirm it. Sometimes I have thought it possible that Warburg's extract was useful

simply as an hepatic stimulant, and thus helped notably to relieve evident uræmic phenomena. Whenever I had gotten rid of the threatening phenomena in this case for a time, I insisted upon a milk diet, koumyss, matzoon, milk and Vichy, etc.; massage daily, or every other day; oxygen inhalations and repeated doses of digitalis in tablet triturate form. Every winter and spring, for several years, I have sent her to the south of France, and thus far she has held her own, and, indeed, I should say, to-day she is in better physical condition than she was several years ago.

In the preceding case and the one narrated before it, I have more than once seen what I believed to be evident and pernicious effects resulting from the use of even small doses of opium or morphine in some form—given by the mouth, for I have never had occasion to resort to the use of morphine hypodermatically in either of the preceding cases. One of the interesting features in my last case is this: During the past two years the character of the urine has changed in a remarkable manner; as a rule, this is no longer light-colored, of low specific gravity, containing albumin and granular casts; on the contrary, it is of a fairly deep color, does not generally contain any albumin, and on several occasions has shown no casts when examined very carefully and by expert microscopists. What is my conclusion? Have I cured a case of interstitial nephritis or not? I will not pretend to solve this difficult question. I would simply report a very interesting clinical fact in my own private experience, of which there may be many in that of my listeners, so far as I know.

I now wish to speak of the use of opiates, and more particularly of morphine in these latter cases, whenever respiratory or other symptoms, such as obstinate or distressing insomnia, seem to require their employment. Personally, I am and always have been much opposed to the use of opiates, and especially of morphine hypodermatically, whenever used in cases of chronic Bright's disease, except in very minute doses. I believe I have seen it do harm so often in locking up the secretions, when just the contrary was imperatively required—in bringing out further symptoms of uræmia, acute or chronic—that it appears to me reasonable to abstain from this medication as long as possible. If its use is forced upon me by symptoms that I have vainly endeavored to relieve by other drugs which are more innocent in their effects, I always make use of it with great care and watchfulness.

There are times, however, when I do not feel in this way, and where uræmic symptoms are unquestionably manifest. In general terms, these are the cases in which the heart is the weak organ primarily, and in which the kidneys will be greatly helped by cardiac stimulation of an active kind. Of the numerous drugs which strengthen, quiet, and regulate a weakened, dilated heart, none at times is comparable to the hypodermatic use of morphine in small or moderate doses. Therefore, when this condition

is obviously the cause of the distressing or threatening symptoms, I am not unwilling to recur to its use. If blood pressure is low, as shown by slight, imperfect arterial tension in the radials, and if the pupils are normal or somewhat dilated, with the previous condition also clearly defined, I am not averse to morphine medication in the manner I have mentioned. Unquestionably, when thus employed, I have had no good reason myself to regret making use of it. When, however, with the weak, irregular, or failing heart, are also present the pulse of lowered tension and the contracted pupil, then I would cry *halt!* because I believe these conditions often mean poisoning from retention in the system of excrementitious substances of different sorts and more or less poisonous, which may rapidly overwhelm the economy in their disastrous effects unless the clear indications of treatment are distinctly made out and followed by the practitioner. Again, in cases where we are in great and legitimate doubt—as we frequently are—despite our most careful scrutiny of a given case, as to which organ, the heart or the kidneys, most evidently needs immediate help—in these cases I advise against morphine hypodermatically as long as possible, on account of the possible immediate and great harm which may follow its use.

Alongside of these cases, and as a further development of similar underlying conditions, is what we often see, *i. e.*, uræmic convulsions actually take place. The quite general teaching of more than twenty years in New York City, owing perhaps more to Prof. Loomis's influence as a very prominent clinician than to anyone else, has been to the effect that morphine hypodermatically in large and repeated doses in acute uræmia has done what no other drug with which we are familiar will do. It will bring the convulsive seizure to a rapid termination; it will at times prevent the recurrence of it; it will break up arterial spasm, it will thus lessen arterial pressure; it will promote diaphoresis; it will greatly increase the bulk of the urine when this secretion is diminished or almost suppressed; it will bring back to life when hope seems almost lost.

In view of the facts so graphically and forcibly brought to our attention by Dr. Loomis—narrated with all the clearness, talent, and ability which characterize his work—we should be loath to throw aside the instruction afforded by the close study of his cases. Inasmuch, however, as I have seen, I believe, disastrous results follow this kind of interference; and when these results could not, in my judgment, be properly explained by the natural development of the renal disease, it is only right that I should endeavor to seek for the cause of this discrepancy. I have allowed my reasons to be seen in part in my foregoing remarks, and I would further add that whenever the convulsive seizure of acute uræmia is evidently directly occasioned by a spasmodic condition of the vessels of the kidneys, and this spasm is more or less general in the

bloodvessels of the body, including in many cases the cerebral mass and the medulla oblongata, I have little doubt that the remedial effects of morphine injections, in tiding over a most critical period of disease, are very remarkable. But let us bear in mind, as the perusal of Loomis's cases and numerous others will distinctly show, that the convulsive seizures were accompanied with *dilated pupils* and a more or less disturbed, perhaps weak, heart action. Moreover, in the coma which habitually follows just such attacks, after the use of morphine, or sometimes, indeed, without its use, the pupil may become of pin-hole size, or very much contracted; the heart may be laboring just as much, or even more, and the kidneys may not secrete an increased quantity of urine. I regard such cases as being among those in which the system is even more overwhelmed with the so-called uræmic poison than the previous ones, and to which I would fain direct closest attention.

In this translation of the immediate or prolonged effects of renal insufficiency, of systemic poisoning thus occasioned, whether occurring in Bright's disease or in mere functional disorder, we must look to several concealed factors involved in the clinical estimate which we should make. In one aspect, the kidney is nothing more than an ordinary filter; in another, it is an *elective* filter, depending, no doubt, for this power in part upon the precise anatomical and pathological conditions affecting it; depending also upon dynamic or vital forces, in regard to which we are almost in the dark even at the present day. Suffice it to add, however, that strictly scientific investigations, more particularly of Feltz and Ritter and of Bouchard, have shown how various are the poisonous ingredients of the urine, and how it is that at different times the kidneys will allow some of these poisons to pass through them, and again will not. Besides, the effects of the retained poisons are very different according to their nature—some doubtless accounting more than others for the pupillary and nervous symptoms; some producing excitement, others depression, lowered temperature, somnolence, and torpor.

These different poisons may also be eliminated from the economy even at short intervals in unequal amounts, and, of course, *different* morbid effects are thus produced, or similar effects in an unequal degree, in view of the combined nature or quantity of the retentions in the economy.

We should also be now convinced of another fact, and it is that neither the condition of the kidneys nor the heart, as shown by pathological researches, will prove satisfactorily, in many instances, the cause of the uræmic symptoms or seizures. We are, therefore, forcibly compelled to look for the source or primary cause of the symptoms elsewhere, and it is often in the digestive tract that we shall most certainly find them. The control of the quality and quantity of the ingesta; the proper and prolonged neutralization of poisons continuously produced

in this system, will thus become a means of prophylaxis against uræmic developments of milder or greater intensity, which will be found second to none. So soon as the most urgent symptoms of acute uræmia are neutralized or antagonized, judicious antisepsis of the digestive tract is a treatment which has the greatest value. Among drugs useful in carrying out this remedial indication, I would speak favorably, from repeated experience, of salicylate of bismuth and beta-naphthol.

In conclusion, I would add that I am convinced in very many such cases, especially among the residents of our cities, in the winter time, oxygen gas by inhalation several times daily, plays a very important remedial rôle. Banishment to a warm, equable climate for the cold or variable months of the year is, of course, generally speaking, a far better substitute than artificial inhalations of oxygen; but this plan, I regret to say, is often wholly impracticable.

FURTHER NOTES RESPECTING THE THERAPEUTIC USE OF THE SHEEP'S THYROID.

By James J. Putnam, M.D.,
of boston.

Since the case of myxœdema and acromegaly reported in The Journal for August were first described,[1] several changes have occurred which are worth noting.[2]

The principal points in the pathological anatomy of the latter disease are brought out by the diagram which I now append, though, since the cases on which it was based were collected, several new autopsies have been reported. The number of autopsies is so small that the percentages have a limited value.

Case I. has continued to do well under the thyroid treatment. An important point has shown itself, however, with respect to dosage. During a good many weeks the patient took two and half grains of the desiccated gland once a day. This controlled the symptoms in a great measure but not wholly, a slight œdema of the eyelids making its appearance after a while, which has since then disappeared.

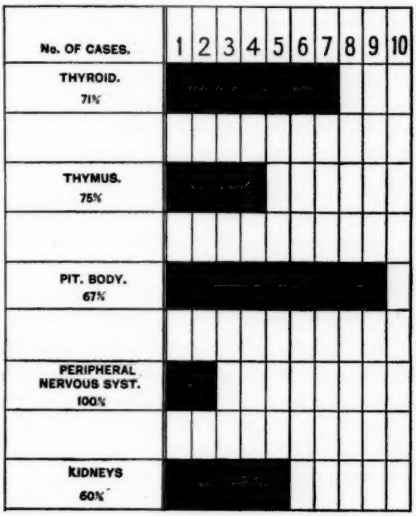
The later history of Case II. is interesting in several respects.

The albumin and casts have disappeared from the urine, and the œdema of the ankles is only seen after exertion.

[1] The paper was originally read at the meeting of the Association of American Physicians in May of this year.

[2] I wish to call the attention of the readers of The Journal to the fact that the diagram printed with the article in the August number was, by a misunderstanding, put upon the wrong page. It was intended to indicate the percentage frequency of the different organ-changes in myxœdema, not those in acromegaly.

During the months of May and June no thyroids were taken. For the first three or four weeks no marked change was noticed. Then the symptoms began to reappear, and by the end of the second month the aspect of the face was nearly as myxœdematous as it had ever been. In spite of this, however, there were no albumin or casts in the urine, and no mental changes. With the resumption of the treatment the patient immediately began to improve again. It is also of especial interest that during the period of no treatment the thyroid gland increased very much in size, and the rapidity of the pulse increased likewise. When the treatment was resumed the thyroid again diminished in size. On further inquiry into the early history of this patient I learned that she had suffered considerably in her youth from palpitation and anæmia.



The patient with acromegaly has distinctly improved in many respects, though not in all. The size of the hands, feet, and face has steadily diminished, and the strength of the hands has markedly increased. The figures representing these changes are as follows:

	April 17, 1893.	June 13, 1893.	July 18, 1893.
Girth of thumb	3¼ inches.	2⅞ inches.	2¾ inches.
" " second finger	3⅜ "	3 1/16 "	2 9/16 "
" " hand at knuckles	9¼ "	9¼ "	
Length of second finger	4¼ "	4¼ "	4¼ "
Girth of wrist at largest part	7¼ "	7½ "	7¼ "
Dynamometer	.....	R. 25 " L 10 "	45 " 20 "

The feet have diminished in size so that she now wears a boot that she could not at first get on.

It will be noticed that these changes do not affect the length of the fingers, and it may be that the improvement has been only in respect to a diminution in size of the soft parts, as in the cases of obesity, and does not indicate any real neutralization of the disease. The patient has certainly grown somewhat thinner in all respects.

The pulse is still rapid and the general condition not satisfactory, though better than before treatment was begun.

The apparent improvement of this case under thyroid treatment naturally brings up again the question touched upon by various writers as to the possibility of a connection between acromegaly and disease of the thyroid, or its kindred organ, the hypophysis. With regard to this question I have nothing additional to offer, except to call attention to the fact noted in my paper, that there is occasionally a certain likeness between cases of myxœdema and cases of acromegaly—although typical cases, of course, differ widely. The two cases spoken of in the paper as presenting points of resemblance to both these affections, while not sufficiently characteristic of either one to justify a positive diagnosis, have both improved in some measure, under the thyroid treatment. The improvement has not, however, been positive enough to increase my willingness to make a definite diagnosis.

Two of the three patients with obesity, referred to in a foot-note in the August number of THE JOURNAL as being under treatment by thyroids (as suggested by Dr. Barron, of Liverpool), have improved very much. One of them has fallen in weight from two hundred and seventy to two hundred and thirty-seven pounds within four months. The decrease has been steady and even, and is still going on. No change was made in his diet or habits. The other patient who has been under the care of my colleague, Dr. F. Coggeshall, has lost forty-seven pounds. A third patient has not improved. All these patients have been taking the desiccated thyroids in the dose of grs. v. to grs. x. daily.

A CASE OF PANOPHTHALMITIS, CAUSED BY THE BACILLUS COLI COMMUNIS.

BY ROBERT L. RANDOLPH, M.D.,
OF BALTIMORE, MD.

(From the Pathological Laboratory of the Johns Hopkins University.)

G. W., aged six years, while drinking at a pump was struck by a companion across the left eye with a piece of wire. He complained of pain, which lasted a few minutes. That night he awoke with violent pain in the injured eye. The next afternoon, twenty-four hours after the injury, he came to the Presbyterian Eye and Ear Hospital.

The condition of the eye was as follows: Penetrating wound of the cornea, extending entirely across the lower border. This wound passed in through the iris and into the ciliary border of the latter. Intense pericorneal injection, contracted pupil, with shallow anterior chamber.

Atropia was ordered to be instilled every four hours, and a compress bandage was applied. The next day the cornea was infiltrated all along the edges of the wound, and in addition to this, hypopyon was present. No light perception. Eyeball sensitive to touch. The pupil had showed no response to the atropia. Traumatic irido-cyclitis. This condition became progressively worse; panophthalmitis in four days. On the fifth day the eye was enucleated by Dr. Chisolm. I carried it immediately to the Pathological Laboratory of the Johns Hopkins University, where it was at once submitted to a careful bacteriological examination. The surface of an area including a part of the cornea and adjacent sclera was thoroughly burnt by means of a red-hot knife-blade. Through this sterilized area a small opening was made with a hot scalpel, and through the opening was thrust a sterilized platinum oese. With the purulent material withdrawn in this way from the aqueous and vitreous chambers, as well as from the inflamed tissues of the eye, agar and gelatin roll cultures and slanting agar cultures were made. Cover-slip preparations were made. An inoculation was made at the same time into the anterior chamber of a rabbit's eye, into which a small opening was made with a sterilized cataract needle through the cornea, the material for the inoculation consisting of that withdrawn with a platinum needle from the vitreous. The eye was then further opened with a sterilized knife and placed in alcohol for further histological and bacteriological examination. The agar tubes were placed in a thermostat at 36° C., the gelatin at 20° C.

After twenty-four hours the agar cultures had developed, showing a large number of grayish-white colonies of a short oval bacillus unmixed with any other variety of colony or bacillus. The growth on the slanting agar was diffuse after forty-eight hours. The gelatin roll cultures showed good growth. The roll made directly from the eye was crowded with small gray colonies, which appeared to be a pure culture of the same bacillus already observed in the agar tubes. No liquefying or other contaminating colonies were present. The second dilution showed larger pale, gray, flat colonies having irregular contours. From single colonies inoculations were made into various culture media, and the bacillus was studied in all its properties for purposes of identification.

The fully developed surface colonies on nutrient gelatin appear to the naked eye as pale-grayish colonies with bluish translucence, often iridescent by oblique illumination, thin, flat, spread out, with notched irregular contours. They attain a size of 5 to 10 mm., and when far apart may grow even larger. Under a low magnifying power they may or may not show a central darker dot. The rest of the colony is finely granular, often nearly or quite homogeneous at the pale, irregular margin, grayish or pale yellow according to thickness, and often presenting markings in the form of irregular wavy lines, sometimes comparable to the lines representing mountains on a map. The deep colonies are round or oval, yellow or brownish, granular. The gelatin is not liquefied.

The agar colonies resemble those in gelatin. The growth in bouillon is a diffuse cloud, settling later as a sediment. Milk becomes somewhat thickened in twenty-four to forty-eight hours at body temperature, and

in two or three days is firmly coagulated. The blue color of litmus milk becomes pink. On potato the growth is abundant, dirty grayish or pale brown, with some gas-formation.

The bacillus in eighteen to twenty-four hours agar cultures shows motility, but some only of the bacilli are motile, others do not move. After two to three days there may be no motile bacilli. In sugar (glucose) bouillon in Einhorn bulbs, gas is produced measuring 2 to 3 ctm. on the scale. Gas is also formed in agar to which glucose has been added. The bacilli, therefore, ferments both glucose and lactose. The bacillus is a short oval bacillus varying somewhat in length, but averaging but 2 to 3 μ. It is rather plump. It is decolorized by Gram's stain, but stains readily with the ordinary aniline dyes. The characters described identify this bacillus as the bacillus coli communis or at least as a member of the group of bacilli included under this name. It was cultivated and studied side by side with a culture of a colon bacillus obtained from healthy feces, and was found to correspond in all morphological and cultural characters to the latter.

Microscopical sections through the hardened eye showed an extensive accumulation of polynuclear leucocytes in the vitreous and infiltration of the choroid and iris with the same cells. Sections stained with Löffler's methylene-blue and with aqueous solutions of gentian-violet showed in the purulent exudate, in considerable numbers, short oval bacilli, often in small clumps, and apparently identical with those observed in the cultures. They were mostly, if not entirely, extra-cellular in situation. No cocci or other species of organism could be detected.

The rabbit's eye which was inoculated directly with a small quantity of purulent exudate from the fresh enucleated eye, showed at the end of twenty-four hours opaque infiltration of the cornea extending a considerable distance from the inoculation wound, some opaque pus on the anterior chamber, hyperæmia and infiltration of the iris, with irregularity of the pupil on the side next to the inoculation, and intense conjunctivitis. The next day the inflammation reached its acme; the pupil was entirely bridged over with a filmy opaque exudation, and there was much pus in the anterior chamber. The opacity of the cornea had extended. Cover-slip preparations from the exudate showed in large numbers and in pure culture the colon bacilli.

In the course of three weeks the inflammation cleared up, leaving a dense opacity of the cornea near the site of inoculation. Several inoculations were subsequently made in rabbits' and dogs' eyes with pure cultures of the bacillus obtained from the enucleated eye of the boy. They were made by carrying into the anterior chamber through a small opening made with a sterilized instrument at the sclero-corneal edge a small quantity of the culture on a platinum needle. In every instance when the inoculation was made into the anterior chamber there resulted a severe conjunctivitis, keratitis, hypopyon, and irido-cyclitis such as has been described, with subsequent subsidence of the inflammation, leaving only partial, often slight, opacity of a part of the cornea. It is interesting to note how rapidly such intense inflammations subside in the eyes of rabbits and dogs, whereas a similar condition in the human eye would ultimately result in loss of function in the majority of cases. When, however, the inoculation was made into the vitreous destructive panophthalmitis resulted.

I injected two drops of a thin suspension in physiological salt solution

of a twenty-four hour agar culture of the bacillus into the vitreous humor of a rabbit by means of a sterilized hypodermic syringe. I made the injection at a point about midway between the papilla and posterior surface of the lens. The primary effect of this injection was simply a slight disturbance in the transparency of the vitreous in its upper part as discerned with the ophthalmoscope. After twenty-four hours the media were so cloudy that the fundus could not be seen. After forty-eight hours the pupil was blocked up with a thick yellowish white exudate, and the anterior chamber was half-full of pus. Chemosis and great injection of the conjunctiva were present. There were all the signs of acute panophthalmitis. The eye subsequently underwent slow degeneration and atrophy.

It is evident from these experiments that the colon bacillus isolated from the enucleated eye is possessed of marked pathogenic power, and is capable of setting up purulent inflammation of the eye, such as was observed in the case of the boy. Inasmuch as this bacillus was present in pure culture, we feel justified, in the light of the bacteriological examination and of our experiments, in regarding it as the specific cause of the inflammation in the boy's eye.

Three ways suggest themselves as possible explanations of the mode of entrance of this bacillus into the eye: 1. With the foreign body. 2. Later, into the wound. 3. By the circulation. As regards the last explanation, it is to be said that the colon bacillus has the power of entering the circulation, and of being carried to distant organs, in case of some lesion of the intestinal mucous membrane. In the present instance the bacillus might find a *locus minoris resistentiæ* in the injured eye. But there was no evidence of any lesion of the intestine, and we regard this explanation as very improbable. We consider, therefore, that the bacillus got into the eye in one of the first two ways mentioned.

The colon bacillus is a normal inhabitant of the intestine, making up no small part of the feces. It is evident that it can be widely distributed outside of the body, and it has been found in water and in the ground, especially under circumstances when these could become contaminated with intestinal discharges.

The bacillus coli communis was first described fully by Escherich, in 1885, who regarded it as capable of causing intoxication by its products, but not as an infectious organism. The first observation suggesting that it might possess infectious properties was made by Tavel,[1] in 1889. The next observation was made by Welch,[2] in 1890.

Welch was the first to demonstrate that this bacillus is a common invader of the body in cases with lesions of the intestines. This interesting bacillus has now been found by many observers in a variety of

[1] Correspondenzbl. f. Schweizer Aerzte, 1889, No. 3.

[2] The Medical News, 1890, vol. i. p. 566. Ibid., 1891, vol. ii. p. 669. Also, Bulletin of the Johns Hopkins Hospital, July, 1891, and Trans. of the Cong. of Amer. Phys. and Surg., 1891, vol. ii.

affections, the most common being peritonitis, angiocholitis, and cholecystitis. It appears to vary very much in virulence and pathogenic power. The case reported in this paper is the first one, to my knowledge, in which this organism has been found in affections of the eye, and it therefore has seemed worthy of record. And here let me thank Professor Welch, Director of the Pathological Laboratory, for the interest he has taken in these experiments and for the many helpful suggestions he has made to me while preparing this report.

A CASE OF SO-CALLED PSEUDO-MYXOMA PERITONEI, WITH OBSERVATIONS ON THE FORMATION OF HYALIN.

By Henry W. Bettmann, M.D.,
of Cincinnati, Ohio.

It was not very long ago that cysts of the ovary other than carcinomatous and sarcomatous were universally considered to be benign growths, incapable of infecting neighboring organs, and never causing relapses after removal. Baker Brown (1) was the first to report a case of infection of the peritoneum and relapse after removal of a simple papillomatous cyst of the ovary; and after attention was once called to the subject similar cases multiplied rapidly in medical literature. Papillomatous cysts were soon universally recognized to be, on the one hand, very liable to carcinomatous degeneration, and, on the other, very prone to transplant themselves upon the peritoneum. For this reason papilla-bearing cysts were separated from simple glandular cystomata, and assumed a position of their own. Some interesting details of this subject are given by Coblenz (2). During the past twenty years observations have multiplied to show that even the simple glandular proliferous cystomata are not in all cases incapable of infecting the peritoneum and producing symptoms of a malignant type. Atlee (6) was the first to report two cases where ovarian cysts produced curious changes of the peritoneum, the same being covered with an adherent jelly-like mass. Beinlich (3) followed with two similar cases in 1874, describing them in full and mentioning a third. These reports were followed rapidly by others. The general features of all the cases were alike. Women, usually over forty years of age, were affected with rapidly growing ovarian cysts. The cysts during operation were found to be very thin-walled; often to have ruptured in one or more places. The contents were thick, gelatinous, and, what is characteristic, the whole peritoneal surface was found coated with a layer of gelatinous substance, 2 mm. to 2 cm. thick, and which could not be removed. As a rule the operations resulted fatally, usually without symptoms of

peritonitis. The reader is referred to the bibliography for a complete chronological history up to date of the cases reported. The pathology of the subject was first elucidated by Werth (11), who demonstrated that in all cases previously reported the outpoured cyst contents remained passive and became attached to the peritoneum by inflammatory processes in the latter. Donat (15) verified the statement of Werth, and suggested the term "foreign-body peritonitis." But not all cases reported were of a similar character. In these the jelly-like coating of the peritoneum was not the only pathological condition found, but cysts similar to the original ovarian one had developed in various parts of the peritoneal cavity. Thornton's (5) case was the first, then followed others by Colrat (7), Baumgarten (12)—three cases, Olshausen (17)—two cases, Schlegtendal (20), Netzel (10), and Runge (18). The behavior of the outpoured cyst-contents constitutes the chief distinction between the two classes of cases. In the first class the contents remain passive; in the second they are active—epithelial elements become fixed in the peritoneum and multiply, forming the new cysts. Olshausen's (17) case No. I. is very interesting in this connection. Epithelium was evidently transplanted, but did not succeed in forming cystic growths; it covered fibrous septa arising from the peritoneum, and, by secreting profusely, filled the abdominal cavity with gelatinous contents. This case occupies a position between the two classes. The definite separation of true transplantation on the one hand, and peritoneal reaction against outpoured cyst-contents (pseudo-myxoma, Werth) on the other, I find nowhere in the literature referred to. It is an advance in the pathology of the subject to keep such distinction clear.

Another point not brought out by former authors is the great rapidity of growth which such tumors display. Definite statements concerning rapidity of growth are made in nine cases. In two (Baumgarten, Schlegtendal) the growth was slow. In the other seven the time between first symptoms and the operations varied between several weeks (!) (Korn, case operated by Leopold) and eight months, Werth's case being operated on four months after first symptoms, Runge's and one of Beinlich's five months. The high mortality has been referred to by all writers. Netzel thinks that early operation will lower the death-rate, but it seems that the operations as a rule were not delayed too long. Of the thirty-five cases so far reported, eighteen recovered, fourteen died, and in three the outcome was not stated.[1]

The case which I here report occurred in the hospital practice of

[1] Since writing the above I have found an additional case reported by Strassmann, in the Zeitschr. f. Geburtsh. u. Gyn., 1891, S. 318. His patient died on the seventh day, of heart weakness. E. Fränkel describes a case in the Jahresbericht d. Schles. Gesellschaft f. Vaterl. Kult., 1891, lxviii. 68-70, but I could not refer to the original. J. Oliver, in the Liverpool Med.-Chir. Journal, 1891, xi. 266-68, reports the rupture of a cyst with colloid contents: original also not obtainable.

Prof. Pawlik. A cystic tumor of the ovary was removed from a woman aged sixty-five. The abdominal cavity was found filled with gelatinous masses. Peritonitis developed and the woman died. The body was brought to the pathological laboratory of the Bohemian University of Prague. The autopsy was made by Prof. Obrzut. Through his kindness I was afforded opportunity of studying the case microscopically, and for this and other friendly service I take pleasure in here expressing my thanks.

Autopsy. Body of medium height; mesogastrium distended; a scar extends in median line from the umbilicus nearly to the symphysis. Basilar ganglia of brain and cerebellum somewhat œdematous. In the abdominal and pelvic cavities a large quantity of fibro-purulent exudation. Intestines distended; serosa injected. Omentum majus thickened, covered with diffuse gelatinous mass which also coats the root of the mesentery. Parietal peritoneum thickened, pigmented, and covered with many nodular gelatinous masses. Spleen and liver enlarged and soft. Stone in pelvis of right kidney. Gelatinous masses cover all the viscera of the true pelvis. Remaining ovary small, fibrous. *Pathological anatomical diagnosis:* Myxadenoma ovarii dextri extirpatum per laparotomiam; peritonitis chronica adhæsiva et purulenta acuta; myxoma peritonei; urolithiasis; sepsis.

It will be seen that, aside from the acute peritonitis, the post-mortem revealed the usual conditions—gelatinous masses covering all the abdominal and pelvic viscera. It was not until the gelatinous coating was subjected to microscopical examination that the case excited more than usual interest. The examination showed the case to possess several unique features which led Prof. Obrzut to preserve the specimens for closer detailed description. The specimens were fixed with bichloride and hardened in alcohol. On macroscopic section the cut surface showed the gelatinous masses to be composed of two quite different constituents. One part appeared gray, did not harden thoroughly, and presented a somewhat meshy appearance. The other was dense white; lay imbedded in the first, crossing it in all directions in strips and plaques without definite arrangement. Microscopical examination showed these constitueuts to be totally different in structure. The gray meshy part was quite simple, consisting entirely of fat tissue and myxomatous tissue; these are arranged with no definite relation to each other; fat cells are found imbedded among the stellate cells of the mucoid tissue; patches of true fatty tissue are found, but the major part is mucoid tissue. It is impossible to infer which of these tissues is primary, or which, if either, is derived from the other. A stroma is recognizable only here and there, and consists of fine fibrils, probably mucin precipitated by the bichloride or alcohol. Staining with picrocarmine or gentian-violet brings out the stroma more prominently.

The myxomatous tissue scarcely requires detailed description. The cellular elements are almost entirely the stellate cells characteristic of mucoid tissue. These have round nuclei which stain only lightly; are

possessed of many long processes which form an interlacing network with the processes of neighboring cells. Round cells are scattered about here and there both in the mucoid and fat tissue, but their number is limited. The firm white masses which lie in this mucoid tissue are usually separated from the same by aggregations of leucocytes, which often form a regular border several layers deep, but often are few or wanting. Bloodvessels are quite numerous and often attain large size.

The firm white portions of the gelatinous substance, in unstained sections, are characterized by their shining homogeneous appearance. The substance is not at all affected by acetic acid, by mineral acids, ammonia, or ether. Its appearance, in fact, is strongly suggestive of amyloid, but with iodine it takes on only a pale-yellow tint, and gentian-violet stains it only a faint blue. Eosin stains it very readily; hæmatoxylin also strongly but very slowly; the carmines give it only a yellow tint. These reactions identify the masses as a substance which of late years has borne the name of hyalin. More careful stains and examination with higher powers reveal peculiarities in the structure of these masses. The greater part is composed of a homogeneous substance which takes on all stains quite faintly and diffusely and which allows no structure to be distinguished. Here and there, however, it encloses scattered cells, many of which resemble leucocytes, others being large and oval in shape. Recognizable here and there in the masses are larger and smaller lakes of blood, the red blood-corpuscles having more or less perfectly retained their normal character. Aside from the homogeneous mass are more fibrinous parts, which form coarse and fine trabeculæ. Both the homogeneous and the trabecular parts are found on nearer examination to be permeated in all directions by minute canals and holes which follow no definite course, often anastomosing with one another, often lying isolated. These minute canals have no walls of their own, being bounded simply by the hyaline masses in which they lie. Often the canals are empty, but usually they contain round nuclei which stain deeply. The canals on cross section look like holes, are usually round, and the contained nuclei often completely fill the lumen. We now see what we originally termed hyalin is really identical with what Langhans (29) described under the name of canalized fibrin, a term which has been generally adopted.

The examination thus far made gives our case of so-called pseudomyxoma a unique character, neither true mucoid tissue nor hyaline substance having been found in any previously described case. Our task is now, by use of finer section and more careful stains, to explain the origin and significance of these tissues. As an introduction to the study of the hyaline masses I determined to read what other observers had written on the subject. I was astonished to find a very large literature in this field, and a variance of opinion among authors such as

is met with in few other topics in pathology. An outline of the history of hyalin and of the various theories and observations concerning its origin may here be of interest.

The recognition of hyalin as a definite morphological substance belongs to modern pathology. It was seen often enough by the older pathologists, but as long as the ideas concerning the colloid metamorphoses in general were so obscure the substance could not be definitely separated from the colloids. Virchow (64) himself says that what in former writings (65) he called "sclerosis" and "atrophic hardening" of tissues is probably identical with what to-day goes by the name of hyalin. Rokitansky (66) in 1849 and 1859 noted hyaline changes in cerebral vessels and described the appearances presented. Billroth (25) described the same conditions. The next observers of hyaline degeneration of cerebral vessels were Wedl, 1863; Arndt (26), Schüle (60), 1868. Arndt gave Thiersch (24) the credit of having first definitely applied the term hyalin to this substance. To Langhans (29) we owe the first full description of at least the morphological properties of hyalin. This he found on the maternal side of the chorions of fully developed placentæ, and gave it the name "canalized fibrin." Grancher (28) and Schueppel (27) had probably had the same substance under observation, the first in cheesy foci in the lungs, the second in tubercles of lymph glands. Schultz (30) described hyaline substances in white thrombi resulting at the seat of wounds in arteries. To Recklinghausen (31) is unquestionably due the credit of giving hyalin a definite place in pathology. He not only collected all past literature bearing on the subject, but also investigated the subject from all possible standpoints—chemical, morphological, micro-chemical, and etiological. He showed how widely scattered it is in the human system and under how many varied pathological conditions it arises. He showed its relation to amyloid, and suggested that the two substances represent different stages of the same process. He suggested also that there may be transition forms between fibrin and hyalin. Hyalin itself, he says, has its source in the protoplasm of cellular elements, which may or may not take up new elements from the blood to form the hyalin. The cells lose their nuclei and fuse together. In extravasations he thinks the hyalin arises from leucocytes and at times from endothelial cells.

Since Recklinghausen's publication in 1883, nothing has been added to the morphology or chemistry of hyalin, though the attention devoted to the subject has been very great. Chief interest centres upon the origin of hyalin. Some writers, such as Schaeffer (56) believe hyalin to be always a derivative of coagulated products or fibrin, and deny to hyalin an independent existence. Others find the most varying sources for hyalin. Thus Peters (34) ascribes the formation of hyalin about the vessels of tissues affected with diphtheria to the degeneration of

leucocytes, but the hyalin in the membrane itself to pus cells, the epithelium, and the preformed connective-tissue cells of the part. Weigert (37) believes the source of hyalin to be the products of coagulation, either fibrin or, when occurring in cells, the product of coagulation-necrosis. Others, again, such as Neumann (39) and Vossius (38*b*), find the changes only in the intercellular substance of connective tissue, the cells being passive and atrophying under the growing pressure.

There is not only no lack of views as to the origin of hyalin in different tissues, but even in the study of the same organs most varying conclusions have been reached. Hyaline changes have been studied most in tubercles, and in the conjunctiva, and the vessels of the brain. Wieger (32) thinks the hyalin of tubercles arises from degeneration and fusion of epithelioid cells. Vallat (36) studied especially the tubercles of the spleen and lymph glands. According to him, hyalin has different sources in different forms of tubercle. In one form hyalin is derived from the reticulum of the peripheral zone of the tubercle; sometimes directly from the reticulum of the spleen and lymph glands. In others, the epithelioid cells are transformed directly into homogeneous flakes without nuclei. Arnold (35) agrees in the main with Wieger. It is difficult, however, to see the consistency of his conclusions. The epithelioid cells he describes as staining intensely with eosin, the hyaline masses little or not at all.

The hyaline changes in the conjunctiva have a literature of their own. Here it is that most frequently a direct relation has been found between amyloid and hyalin, the two substances often lying side by side. Raehlmann (40) believes that amyloid of the conjunctiva is always preceded by a hyaline stage. Wild (59), in studying a case of widespread hyaline degeneration comes to the same conclusion. Reymond (47) was the first to describe hyaline changes in the eye. Raehlmann states that the hyaline changes are always limited at first to the cells of the adenoid tissue of the conjunctiva. Wagenmann (42) reports three cases of hyaline degeneration about the lenticular capsule. He believes the hyalin to be derived from the capsular epithelium, possibly in one case from the endothelium of Descemet's membrane. Poriwaeio (41) found amyloid and hyalin side by side in the same conjunctival growth. Kamocki (43) in two cases, and Vossius (38) in three, could find no transition form between hyalin and amyloid. The former believed the cells of the adenoid tissue to be the source of the hyalin, the latter the intercellular substance of the same. Oeller (45) found about one-tenth of the capillaries of the chorio-capillaris hyaline in a case of lead-poisoning. He noted numerous hemorrhages between perithelium and endothelium, and saw clearly the gradual change from red blood-corpuscles into homogeneous masses and hyalin, and this not only in the perivascular spaces, but also in the lumina of the capillaries and arterioles.

Turning to the bloodvessels we find the same diversity of opinion. Wieger and Holschewnikoff (49) believe the hyalin to result here from transformation of a cellular infiltration of the vessel wall. Ziegler and Vossius think the vessel wall is swollen by a protoplasmic exudation which coagulates. Neelsen (48) believes that endothelial cells form the hyalin. Interesting observations have been made on the formation of hyalin in the kidney by Obrzut (50). He here found the hyaline substance in the capillaries of the glomeruli, around the canaliculi, and in the inner surface of the capsule of Bowman, to be derived directly from all the corpuscular constituents of the blood. A direct transition from blood corpuscles into hyalin was clearly seen and illustrated.

Sections of our new growth were subjected to the most varying staining processes, iodine, safranine, picrocarmine, borax-carmine, hæmatoxylin, eosin, vesuvin, and Weigert's fibrin method (37*c*), besides combinations of the different stains. The most instructive preparations were obtained by allowing the sections to remain twenty-four hours in a dilute solution of hæmatoxylin and then counter-staining with eosin. This method has the advantage of staining fibrin very regularly and clearly, so that even small fibres stand out very distinctly—sometimes with as much clearness as with Weigert's method. In the perfectly homogeneous parts of the section it was impossible even with highest powers (Leitz oil immersion $\frac{1}{12}$, oc. 3), to recognize any structure. Evidently any effort to trace here the histogenesis of the tissues would be fruitless, as evidently these homogeneous masses represented the oldest stages and most advanced changes of the process, whatever it may be. Turning next to those parts where blood lay more or less unaltered in the tissues: here the changes would probably be fewest and most easy to follow. The result was not disappointing. Imbedded in the blood was quite a quantity of fibrin; this appeared in some places in fine fibrils, in others it formed coarser meshes and trabeculæ. It was by following the fibrin to and over the margins of the blood-lakes that clear light was thrown at least upon one source of the hyaline masses. It could be seen without possibility of mistake, that the fibrin went over continuously into the hyaline masses, losing its fibrillar character more and more, and finally assuming all the characteristics of hyalin. Recklinghausen says that we are often unable to distinguish fibrin from hyalin, unless we cling unconditionally to the idea that fibrin presents a fibrillar structure. Here we are forced to the conviction that hyalin is simply a stage in the degeneration of fibrin, that the fibrin becomes more compact, and, through some chemical change, assumes a diffuse homogeneous appearance. The same gradual transition from fibrin into hyalin is seen in various conditions. It can be seen exquisitely in some cases of endocarditis verrucosa. Meyer (33) describes it in the walls of aneurisms in phthisical cavities, Takács (63) in a case of multiple

neuroma. Weigert (37*a*) says the fibrin of serous inflammations nearly always becomes hyaline. Hanau (57) saw fibrin and blood-plates change into hyalin in white thrombi. Virchow (62) states that the thrombi in the pulmonary arteries of dogs usually becomes hyaline between the second and seventh day. Dreyfuss (54) describes two forms of hyalin around the milk ducts, one homogeneous, the other fibrillar, the two being directly continuous. There can be no doubt that fibrin and hyalin are slightly altered conditions of the same substance, and that fibrin passes very readily and frequently into a hyaline condition. The present observation is but an addition to what has by this time become a strong chain of proof.

But not all the hyalin in the present case can be derived from fibrin; at least this cannot be demonstrated by observation, and the amount of fibrin seems by far too small to produce so large a quantity of hyaline substance. It is here, again, that reference to the blood-lakes gives a solution to the question. The blood in the middle of the lakes is quite unchanged; in some cases the whole lake presents quite a normal appearance, the red corpuscles having taken on a rosy-red eosin stain, and being separated from the surrounding tissue, either abruptly or by a thin layer of fibrin. In other parts it was very instructive to study the margins of these blood-lakes. Instead of stopping abruptly, the red blood-corpuscles went over quite gradually into the surrounding hyaline masses, becoming more and more crowded together, their outlines becoming more and more hazy, until they were quite lost in the hyaline mass. Here, a direct transition from red corpuscles into hyalin, such as seen by Oeller in the chorio-capillaris, can be inferred. Further proof of this conclusion can be obtained by using intense eosin stains. As in the case of Oeller, one is here surprised to find the outlines of red corpuscles in places which, by other staining methods, looked trabecular or homogeneous. The same observation can be made after careful staining with Weigert's method. In patches, homogeneous under low powers, the outlines of red blood-corpuscles can here and there be seen more or less dimly with the aid of the immersion lens. We are almost forced to the conclusion that hyalin is here the result of degenerative processes in the red blood-corpuscles. This supposition also finds support in other parts of the body; in fortunate specimens of endocardial thrombi this transition can be seen, also in the canalized fibrin of the chorion; and is mentioned besides in the cases of Oeller, Takács, and Obrzut.

The number of writers who have called special attention to the direct transformation of red blood-corpuscles into hyalin is few; yet it is impossible to read carefully the literature of hyalin without coming to the conclusion that such transformation has often enough been seen, but has been usually wrongly interpreted. Holschewnikoff describes hyaline

changes in cerebral vessels. Often he found veins wholly choked up with hyaline masses which stained very faintly with hæmatoxylin, eosin or gentian-violet. It is natural to consider the hyalin here as altered blood. He quotes Kolessnikoff, who also found hyaline masses filling up the vessel lumina. Schüle, describing "flaky degeneration" of cerebral vessels, finds lumina choked up with the flaky masses. Adler (61) also describes highly refracting masses choking cerebral arterioles. He considers them a post-mortem deposit from the blood plasma. More convincing observations which seemed to have escaped correct interpretation have been given us by Kriege (55). I may be pardoned for quoting from him more fully. He froze rabbits' ears by means of the ether spray and subjected the ears to microscopic investigation after varying intervals of time. After two hours' interval he found the bloodvessels dilated and filled with blood; *the blood column in the dilated vessels was interrupted here and there by finely granular thrombi;* examined after twenty-four hours the vessel walls were absolutely unaltered, *but the thrombi had undergone hyaline degeneration.* Here the connexus seems clear, yet Kriege mentions only the possibility of white corpuscles giving rise to the hyalin. Examining ears after two days' interval, he found some vessels filled with hyaline trabeculæ; in large vessels fibrinous coagulations bordered directly on the hyaline masses, yet Kriege mentions no possibility of the fibrin having became hyalin. The view, therefore, that hyalin may be a direct product of degenerated red blood-corpuscles seems supported from many sources. Besides having been observed directly by Langhans, Oeller, Takács, Obrzut, and myself, the process is made probable by observations of Holschewnikoff, Kolessnikoff, Schüle, Adler, and Kriege. The difficulty in the recognition of such origin is the fact that, with age, hyalin becomes more and more homogeneous and stains more and more imperfectly.

Turning our attention from the hyaline part of our new growth to the mucoid part, we are met with even greater difficulties regarding the histogenesis. We are seriously handicapped by two facts: the obscurity relating to the origin of myxomata in general, and the fact that the original ovarian cyst was not preserved for more careful examination. The existence of primary myxoma of the ovary is doubtful. Olshausen states (67) that so far no case has been demonstrated. Cohn (68) collected one hundred cases of malignant tumors of the ovary from Schroeder's clinic, and included three under the name of myxoma, without stating, however, what he meant by the term. Hjelt (69) also reported a thirty-pound myxoma of the ovary, but the review in the *Jahresbericht* failed to give histological details. Myxoma of the ovary secondary to carcinoma has been reported recently by Griffith (70), and secondary to endothelioma by Von Velits (71). Primary myxoma of the peritoneum, though very rare, undoubtedly occurs. The oldest re-

ported cases are by Waldeyer and Ritter (73), more recent cases by Eve (74), Madelung (75), and Langer (76). Terillon (77) collected altogether sixteen cases, and describes a case in a male; but our own case finds no light from the cases previously reported, and we are compelled to seek conclusions in the growth itself. The closest study of the relations between the fibrinous and the mucoid structures on the one hand and the mucoid and fatty on the other, fails to make the origin of the mucoid tissue clear. We find the three different tissues mixed up without the slightest show of special arrangement. Part of our new growth we know to be the product of a bloody effusion. Is it not possible to refer the mucoid tissue to the same source?

The cases in which myxomata have arisen after traumata, or in connection with exudations or hemorrhages, are not few, and often a direct histogenetic relation may be traced. A few cases may be quoted.

Burresi (78) mentions the case of a man who after a severe blow on the head developed chronic headache and convulsions. Autopsy after several months revealed ten myxomata in the brain, two of which lay between the pia and arachnoid. The same case had three minute myxomata in the kidneys. Elben (79) describes a case still more suggestive. A boy, aged five, was severely injured and died after several months. Autopsy revealed a thirteen-pound hemorrhagic myxoma springing from the peri-renal fat. Elben believes the myxoma to have arisen from the hemorrhage around the kidney. Passavant (80) ascribed a myxomatous neuroma to an exudation, rich in fibrin, between the nerve fibres. Arnold (81) described minutely a myxo-sarcoma of the pia mater. He believed the mucoid tissue developed out of the granulation tissue, the cells assuming spindle and stellate forms, and the intercellular substance degenerating. Those cases are also of importance where myxomata develop within the circulatory system. Breus (91) cites the case of a man, aged forty, where a myxoma developed within the venous system from the testicle to the heart. Examples of pure myxomata developing in the left auricle of the heart have been described by Bamberger (82), Wiegand (83), Salvioli (84), Virchow (85), and Boström (86), and though here the origin was ascribed to the connective tissue of the endocardium, origin from thrombi is not altogether improbable. Recklinghausen (87) described a myxoma in the base of the tongue in a case of ranula. The myxoma was separated from the lingual tissue on one side by an intensely white and opaque substance (fibrin?) and on the other by hemorrhagic infiltrations.

When direct observation fails we are compelled to resort to theory. It seems not improbable that in many of the just mentioned cases myxomatous tissue arises directly from degeneration or other changes in plasmatic exudations or blood-corpuscles. This process seems the most probable one in our case of pseudo-myxoma. Effused blood is found

unchanged; here and there it has lost its normal condition, the corpuscles being no longer clearly defined: in other places degeneration has proceded further: the corpuscles have fused together into hyaline masses which stain heavily with eosin and hæmatoxylin. Still older parts have become perfectly homogeneous and take up no stain well. It were but another step to change into a perfectly unstainable transparent ground substance of mucoid tissue. As to the origin of the stellate and fat cells we have no clue. We may believe that they are the changed leucocytes, but there is no proof in favor of such a view.

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REVIEWS.

MANUAL OF CHEMISTRY. A GUIDE TO LECTURES AND LABORATORY WORK FOR BEGINNERS IN CHEMISTRY. A Text-book specially adapted for Students of Pharmacy and Medicine. By W. SIMON, Ph.D., M.D., Professor of Chemistry and Toxicology in the College of Physicians and Surgeons, Baltimore, and Professor of Chemistry in the Maryland College of Pharmacy. New (fourth) edition. 8vo., pp. 490. Philadelphia: Lea Brothers & Co., 1893.

A BOOK which, like Professor Simon's work before us, has gone so rapidly through four editions scarcely needs comment, for both students and teachers must have decided in its favor and endorsed its methods and contents. The distinguishing feature of this book consists in the excellent colored plates by which color reactions and precipitates are illustrated. This is not alone unique, but is also a laudable endeavor to impress the student with landmarks in his course on chemistry.

The more uniform system of orthography and nomenclature for chemical terms, as proposed by the American Association for the Advancement of Science, has not been fully adopted in this work, and perhaps wisely so. Such changes in text-books must be gradual, as the teacher and student will only in time arrive at that standard. Reforms in this direction are subject to evolution, and usage as well as habits cannot be broken abruptly by everyone without impairment of the usefulness of teaching.

As much may be said of the periodic classification of the elements, and though this should probably best appear side by side with the older system of classification for some time to come, yet the change should be made as one that becomes necessary for our adaptation to modern methods of study. It was some time before we could drop the incubus of organic chemistry, but the general adoption of the study of the carbon compounds in its stead has by this time, even among physicians, been arrived at.

The analytical processes of the fifth part are given with much clearness and deserve favorable mention, though some processes might have been added to advantage here. Thus the Volhard's method of determining silver with ammonium sulpho-cyanide should have appeared amongst the volumetric methods.

The part dealing with the consideration of the carbon compounds shows careful elaboration, and the experience of the teacher is clearly indicated by the stress laid on leading points. The arrangement of the haloid ethers amongst and after the aldehydes is, by way of proper sequence in the substitution of the hydrocarbons, somewhat objectionable, although for medical and pharmaceutical purposes they might perhaps be so arranged. The plate illustrating the color reactions of the

alkaloids is brilliant and realistic, and the completeness of the alkaloidal reactions make this part of great value to the student of pharmacy and toxicology.

The ptomaïnes, leukomaïnes, and toxalbumins appear also in this part, together with the proteids, and form a material improvement. By far the greatest advancement has been made in Part VII., on Physiological Chemistry. Here the Chemistry of Foods, of Nutrition, Digestion, Assimilation, Respiration, together with the fluids of the body, is treated in a happy manner.

The addition of the Chemistry of the Gastric Secretions is especially commendable. The study of the Milk is fully entered upon, as well as that of the Urine. The latter especially is enhanced, and the color reactions in Urinalysis as illustrated here are beautifully represented and must prove highly instructive.

Prof. Simon's work is no doubt now one of the best text-books on chemistry for the students of medicine and pharmacy. L. W.

MANUAL OF PRACTICAL MEDICAL AND PHYSIOLOGICAL CHEMISTRY. By CHARLES E. PELLEW, E.M., Demonstrator of Physics and Chemistry in the College of Physicians and Surgeons (Medical Department of Columbia College), etc. New York: D. Appleton & Co., 1892.

IN the preface to this book the author states that he has interrogated and visited the leading medical schools, both abroad and in this country, to determine a course of practical chemical instruction to be adopted. He claims that in every case where the practical instruction given was more than merely urine analysis, with sometimes a little toxicology, it consisted of a regular course of qualitative and perhaps some quantitative analysis.

This course was rejected by him as being too chemical and too little medical, and his work originated with the purpose of overcoming these defects. To this, first of all, we must take exception. From our personal knowledge of chemical teaching in the principal colleges of this country such is not uniformly the case. The student usually is little prepared in chemistry when he enters upon his medical studies, and to take up toxicology and physiological chemistry he must first be taught the principles of practical work in a chemical laboratory.

In all the colleges which give a three or four years' course the first year's practical study is usually employed in "qualitative" and also some "quantitative" work as applied to poisons, their reactions, detection, and determination. Otherwise the course of chemistry would certainly be deficient of a material part, and where such studies could be made except in the chemical laboratory is not apparent. Either the author has to deal with advanced students only, or he ignores a part of the medical curriculum lacking which no physician could be considered safe or efficient.

If the book is intended for advanced students of medicine and practitioners, it certainly deals with matters of great importance for them. As a practical study in the Chemistry of the Carbon Compounds the book gives to each subject first an explanation in a brief and clear

manner, following this with directions for laboratory experiments in the manner found in other text-books on physiological and pathological chemistry (such as T. Cranstoun Charles, etc.). Part I. treats of the Carbohydrates and their derivatives; Part II., the Fats, illustrating the formation of soaps, of glycerin, and the distinctive tests for butter and oleomargarine; Part III. treats of the Proteids, their classification and reaction. The inorganic constituents of the body are taken up in Part IV., dealing with oxygen, hydrogen, chlorine, also hydrochloric, sulphuric, carbonic, nitric, and phosphoric acids. Iron, aluminium, calcium, magnesium, are here considered, also the alkaline metals. Part V. is devoted to Water Analysis, and we note with satisfaction that the bacteriological test is given here, besides the chemical tests for free and albumoid ammonia, the nitrites, nitrates, and the test for hardness.

The Animal Tissues and Secretions, Part VI., comprises the chemistry of bone and especially of milk, both animal and human, and its preparations. The portion relating to milk-testing deserves special mention for its completeness and detail, in particular as refers to breast milk. The chemistry of the blood is here also considered, and given along with its microscopy and spectroscopy usually taught in physiological laboratories.

Part VII. treats on Digestion, and embraces the clinical tests of the gastric juice by Dr. Kinnicutt. This is given in accordance with modern researches on the subject, and it is only to be regretted that the author did not also add a quantitative test for hydrochloric acid in the gastric juice, as without this all gastric chemical diagnosis is largely guess-work.

In Part VIII. the chemistry of the urine is well treated, though we cannot see why the quantitative determination of uric acid either by Haycraft's or Ludwig's methods is not given, for only by its quantity can it be shown to have diagnostic bearing or pathological importance. In the determination of sugar in the urine, the most practical and perhaps the only reliable quantitative method, by the polariscope, is not given. Part IX. on the microscopical examination of the urine is complete, and is illustrated by beautiful colored plates. The introduction of the centrifugal apparatus for separating urinary sediments is commendable.

As a manual and guide for practical work in physiological chemistry, this work deserves favorable mention. While we cannot consider that it covers the entire ground of chemical studies requisite for a medical course, it will prove a valuable addition to the library of the advanced medical student and practitioner of medicine. L. W.

TRAITÉ DE CHIRURGIE DE GUERRE. Par E. DELORME. Tome II. 8vo., pp. 1018. Paris: Felix Alcan, 1893.

MILITARY SURGERY. By E. DELORME. Vol. II.

THE first essential of a good book is a good text; the second a good index. We know of nothing in which the French almost uniformly fail so much as in the latter. The present work, consisting of two large volumes, has at the end of the second volume a meagre table of contents, and absolutely *no index whatever*. At least two-thirds of the value of the book is therefore lost; for if one wishes to discover what the author says about any particular topic which may be alluded to in several parts

of the book, he must laboriously hunt it up first in the table of contents and then by turning over leaf after leaf of the text. If the French would but imitate in this respect the American, English, and German medical books, it would be an immense gain and would make their literature much more accessible to readers. It is often neglected and left unquoted by reason of this fault and of its diffuseness.

The present volume deals with lesions of bones and joints and amputations. These are followed by nineteen chapters considering the lesions of as many different regions of the body, and covering over six hundred pages. Then follow the consideration of lesions caused by powder and other explosives, and the organization of the medical service in time of war. Next comes a chapter giving the statistics of the loss of life in various wars, and, curiously enough, a rather brief series of "addenda" concerning recent changes in projectiles, complications of gunshot wounds, hemorrhage, foreign bodies, tetanus, malignant œdema, and hospital gangrene. These various addenda cover but thirty pages, and many of the more important, such as hemorrhage, etc., only a page or two. The book, therefore, while very full in many respects, is ex tremely disappointing in the treatment of these later subjects. In so large a work one has a right to expect the full consideration of such topics, and is put off with a *résumé* so brief as to be practically useless.

Moreover, the book smacks of antiquity in most of its pages. There is too much of Dupuytren and Larrey and too little of modern surgeons, and in many topics it ignores by silence the recent improvements in surgery. For instance, the author's consideration of abscess of the brain is singularly lacking in that precision and clear statement of symptoms which one would expect in a text-book of the present day. Nothing is said as to the subnormal temperature of abscess, and, in fact, his conclusion is that "the symptoms of abscess of the brain are obscure"—and certainly in his statement they are. It is true that he favors immediate trephining in depressed fractures, even if they be simple, and *a fortiori* in compound fractures and in intra-cranial hemorrhage; but this important topic is very imperfectly treated. He refers to Horsley's achievements as "operations hardies," and he fails to give to these operations and to the many that have followed in their wake a due consideration.

In gunshot wounds of the abdomen he mildly approves intervention, but so far as we have seen there is but one reference to Senn, who appears only in a foot-note, as "Seen;" and the whole question of intestinal anastomosis is very inadequately treated. No reference seems to be made to Senn's or Abbe's or other methods of enterorrhaphy or intestinal anastomosis. He approves, however, of nephrectomy in cases of seriously wounded kidneys.

Amputation of the shoulder he advocates in preference, in general, to resection or conservative treatment, and in support of this view quotes the mortality of our Civil War as only 28 per cent. When in doubt as to the character and amount of injury to the shoulder, he very properly advises an incision down to, and even into, the articulation, in order to solve the doubt. His preferential method of amputation is that of Larrey, on account of the ease of arrest of hemorrhage and good drainage. No mention, however, is made of the use of Wyeth's pins, not only in amputation of the shoulder, but even in amputation of the hip. His chief resources for controlling hemorrhage are the older ones,

although in a foot-note (not in the text) the somewhat analogous use of the pins by Trendelenburg and Varick is mentioned. Nothing is said even of Furneaux Jordan's method.

We have singled out these few points as indicative of the general character of the work. If one wishes to find the pathology, history, and detailed description of lesions following gunshot wounds of bones, joints, or different regions of the body, he will find here an ample storehouse; but when it comes to the methodical, systematic statement of symptoms, and especially of treatment, the book is singularly lacking.

W. W. K.

CHOLERA: ITS CAUSES, SYMPTOMS, PATHOLOGY, AND TREATMENT. By ROBERTS BARTHOLOW, M.D., LL.D., Emeritus Professor of Materia Medica, General Therapeutics, and Hygiene in the Jefferson Medical College of Philadelphia. 12mo., pp. 127, with 9 engravings. Philadelphia: Lea Brothers & Co., 1893.

IN brief compass, and with his characteristic, clear and forcible style, Dr. Bartholow has expressed in this book the gist of present knowledge regarding cholera.

As would be expected from a veteran therapeutist, treatment receives ample space and careful attention. Now that the tendency is to minimize the achievements of medicine in contrast with those of operative procedure, we are glad to note that the author finds that progress has been made even in the difficult problem of dealing with cholera. He selects from the experience of others and his own studies in two epidemics those resources proven valuable by trial. Among them we find the administration of calomel in the early stage of the disease; enteroclysis and hypodermatoclysis; the free use of dilute acids, and the hypodermatic use of stimulants selected with reference to the particular need of the individual. When combined with methods of prophylaxis of tried and acknowledged value, these methods of treatment fully justify Dr. Bartholow's belief that substantial progress has been made in the prevention and treatment of cholera.

The book contains illustrations of interest and practical value.

E. P. D.

HYPNOTISM, MESMERISM, AND THE NEW WITCHCRAFT. By ERNEST HART, London. With 20 illustrations, pp. 182. New York: D. Appleton & Co., 1893.

IN this small volume Mr. Hart has given medical men a most useful criticism and analysis of a mass of clinical reports and experiences whose peculiar character has commanded wide attention.

Dr. Luys has detailed such extraordinary performances at the Charité that the credulity of his readers has been put to a test in reconciling the accounts given with the carefully observed phenomena of nervous pathology. Mr. Hart shows quite clearly how readily an hysterical,

neurotic individual, when made the subject of frequent experiment, may become a trained and conscious actor of a desired part. Nothing is more deceptive than the apparent success of an experiment or demonstration, and it is not strange that Dr. Luys has yielded to the satisfaction of observing his theories demonstrated and his methods of treatment efficient.

The book should do good to lay readers who are fond of dabbling in quasi-mental science. Humbug is, however, an ever-present, perennial bacillus, and when the present farce has tired the audience another will appear. In America "Christian" Science and Faith-Cure hold the stage at present.

The book contains copies of photographs illustrating the various acts in the performances described. E. P. D.

A TEXT-BOOK OF OPHTHALMOLOGY. By ERNEST FUCHS, M.D. Authorized translation from the second enlarged and improved German edition. By A. DUANE, M.D. New York: D. Appleton & Co., 1893.

IT seems hardly necessary to add more words of commendation for this admirable book than have already been accorded by numerous reviewers. We have but rarely indeed read a book with such unmixed satisfaction and profit as this treatise of Professor Fuchs. From cover to cover it is pervaded by a truly scientific spirit. While presenting in a calm and judicial tone the sum of our knowledge up to date, the author has nevertheless succeeded in concealing his own personality behind the facts which he presents and discusses. Although every page reveals the broadest learning and the most careful and painstaking investigation, the book is entirely free from the offensive spirit of the pedant. While due credit is awarded the work of fellow-laborers in the same field, it is nevertheless not a book emanating from the library alone, but everywhere bears evidence of research in the laboratory and clinic-room. Such accurate pictures of pathological conditions could not have been drawn by the pen of one who had not lived, as it were, in the field, with sketch-book in hand. Every experienced surgeon must at once recognize the descriptions of disease and the accompanying symptomatology as true to nature. This is particularly true of the chapters in which are treated the affections of the lids, conjunctiva, and cornea, to which our author has with apparent delight devoted himself.

If any criticism of these chapters is to be recorded it would be on the almost indifferent tone which creeps into the concise but clear sentences when it becomes necessary to relieve or cure the conditions which have been so thoroughly investigated and admirably described.

There are many points in these chapters to which the reviewer would like to call more general attention did space permit; *e. g.*, on page 146, in discussing the etiology of corneal ulcers, the statement is made that "the staphylococcus is always found in the secretion of a conjunctiva affected with catarrh. If now, through a slight traumatism of any sort, the protective epithelial covering of the cornea is injured at some spot, the door is opened for the entrance of cocci into the tissue of the cornea." As in this statement, so throughout the article is great prominence given

to the important rôle played by specific organisms in the causation of inflammatory affections of the eye. Indeed, the complete recognition of the infectious nature of inflammation, and the fact that the disasters following operative procedure are due to like cause, may be said to furnish the keynote of the treatise, and to give to it the admirable harmony which constitutes its charm.

Praise, in almost like measure, may be accorded to the one hundred and twenty pages devoted to the affections of the uveal tract. But even here is noticeable a fact which becomes more apparent as one advances in the book. An increasing brevity of statement, and the general treatment of the subject in hand, leaves the impression upon the reader that allotted space was hampering the writer, or that time forbade the same full, almost encyclopædic treatment which had been so entirely satisfactory in the chapters devoted to the diseases of the external tunics. Here, however, the more serious nature of the affections has stimulated to a greater enthusiasm in advice regarding treatment; and the large experience and excellent judgment in the management of these affections must excite the admiration of everyone who has seen much of the disastrous consequences of the diseases of the chorioid, ciliary body, and iris. The author's recognition of the fact that inflammation confined to one part of the uveal tract rarely or never occurs is worthy of mention, as we believe this is too frequently overlooked in practice. "That the ciliary body is pathologically altered in most cases of apparently simple iritis is put beyond doubt by anatomical investigations." With this statement the reviewer is fully in accord, and believes that were this more generally recognized the great gravity of the disease would be more constantly before the mind of the surgeon.

We were much impressed in reading this chapter by the valuable aid drawn by the author from histology and embryology in elucidating the clinical facts presented by disease of the uveal tract. A notable example of this will be found on page 244, where the teaching of embryology is employed to show that "both the ligamentum pectinatum and its derivative, Descemet's membrane, belong to the uvea. Hence, embryologically speaking, the uvea forms a perfectly closed, hollow sphere, consisting of the chorioid, ciliary body, iris, ligamentum pectinatum, and Descemet's membrane." The importance of this in explaining many clinical facts cannot readily be overstated.

In speaking of the use of mydriatics, the erroneous statement is made, or implied in parenthesis, that duboisia and hyoscyamia are identical, an implication which will not be accepted by those who have made a careful study of the physiological action of these drugs. Although the chemist may demonstrate their isomeric relation, they are not by any means identical in their physiological properties.

In discussing the enucleation of the eye in sympathetic irritation and inflammation, our author avoids an expression of opinion as to the means of its transmission; but advises early enucleation in sympathetic irritation, in order to avoid the graver conditions to be encountered when the sympathetic ophthalmia has been set up. In the prodromal stages of the latter the offending eye should be removed, since even then the outbreak may be averted. The value of iridectomy in chronic irido-chorioiditis is urged as having a favorable influence over the entire nutritive condition of the eye—a statement the reviewer has had many opportunities to demonstrate as true.

The entire subject of glaucoma is disposed of in a chapter of twenty-eight pages. We cannot but wish that a fuller statement of the author's large experience had been given; certainly for the sake of the student. Nevertheless, in this brief chapter is found a concise review of the present views, in which but little is missed by the attentive reader who has the requisite experience to interpret the brief statements at their true value. The extreme gravity of hemorrhagic glaucoma is stated, and the reason given, viz: that "the hemorrhages are the expression of changes in the vessels or disturbances of circulation." The value of sclerotomy as compared to iridectomy in these cases is not, however, mentioned. We were pleased, however, to see that he throws the weight of his testimony in favor of iridectomy in simple glaucoma. After insisting upon the unconditional necessity for its performance in inflammatory glaucoma, and the permanence of its results, its influence in simple glaucoma is stated as follows: "In glaucoma simplex only the maintenance of the *status quo* is to be counted upon. In a certain number of cases the operation is unsuccessful, or actually does harm. Nevertheless, as without an operation the eye will certainly go blind, iridectomy is indicated in glaucoma simplex, too—at least in those cases in which an evident increase of tension is demonstrable." On page 358 statistics of other observers, and his own experience in thirty-nine cases observed for a mean period of five years, are given to show that in about half of the cases in which iridectomy had been done the success had been permanent. In the light of such experience, the surgeon certainly need not hesitate over the performance of iridectomy in the presence of a malady which will surely prove fatal to vision if left to run its course unmolested.

Passing over the brief but excellent chapters devoted to the study of the diseases of the lens, vitreous body, retina, and optic nerve, and the affections of the eyelids, we come to Chapter XIV., on "Disturbances of Motility of the Eye," to which fifty-seven pages are devoted. We here find one of the most comprehensive, clear, and satisfactory statements of this intricate subject we have seen. Notwithstanding this admirable review of the principles involved, many American readers will be disappointed over the absence of any mention, except in a foot-note by the translator, of the nomenclature of Dr. Stevens and of the measurement and treatment of the heterophorias, to which he has devoted so much study. Insufficiency of the internal recti muscles, in the author's view, seems "the condition which mainly requires consideration," and for this prisms are advised, except in the higher degrees of the trouble, when tenotomy is indicated. No mention is made of the later and more accurate methods of measuring the muscular deviations. The troublesome reflex symptoms attending upon these conditions, as well as upon the errors of refraction, if mentioned at all, are passed over so lightly that the student would not be adequately impressed by their real importance in the routine of practice. This scanty statement must strike the American reader of experience as strange when the entire subject of disturbance of motility is handled in such a masterly manner.

Part III. is devoted to the anomalies of refraction and accommodation, which are disposed of in sixty-seven pages, but the careful reader will not fail to find in them every essential fact stated. The student, however, entering upon this part of his work for the first time would find it difficult to comprehend the real practical importance to his patients of these defects. In a word, if the great clinical importance of the

errors of refraction, accommodation, and of the muscular balance are appreciated by the author, he certainly has not given to them adequate expression in these chapters.

Part IV. is one of the most interesting and useful parts of the book. It is devoted to the operations upon the eyeball and the "adnexa bulbi." For this chapter have been reserved much of the practical detail which the reader misses in the rest of the book. It opens with general remarks upon the importance of the antiseptic method, "which represents the greatest progress made in surgery during recent times." . . . "In operations upon the eye we have less to do with antisepsis than with asepsis; we do not have to disinfect a contaminated wound, but to make a wound that is clean, and keep it from contamination." On page 672 the importance of surgical cleanliness is again stated in the following words: "In former times much more importance was attached than now to the shape and position of the section, especially in cataract operations, the hope of a happy result being based solely upon the proper performance of the section. At the present time we know that the rigorous carrying out of antisepsis in the operation and after-treatment is of much greater significance than the choice of a method of operating. Any section which is of the necessary size, and is suitable in position, gives good results, if in other respects we proceed with the most scrupulous cleanliness." In the after-treatment of cataract the bandage or dressing is to secure protection, all pressure to be carefully avoided. To this end, a pad of cotton is secured over the eye by a single strip of linen, which is fastened to the brow and cheek by adhesive plaster, and injury by contact prevented by a wire screen. "There is no necessity of darkening the room;" direct rays of light, however, are cut off by a screen placed between the patient and the window. It would be a pleasure to direct attention to many of the useful hints which are dropped into this part of the book from the evidently large and well-directed experience of the author, but enough has been said to point out the richness of the feast here provided for the student.

The work of the translator has been done in the most praiseworthy manner, and the publishers have in like manner furnished an admirable example of the high art which can be displayed in the arrangement of type and in the illustration of scientific books. S. D. R.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

The Therapeutic Uses of the Nitrites and Allied Compounds.

Dr. D. J. Leech believes that it is probable that the nitrites affect more or less all the tissues of the body, but their more distinctive influence is upon the blood and the muscles. In the blood they convert the oxyhæmoglobin into methæmoglobin, and this conversion is connected with a locking up of oxygen in this new compound. It is probable that in contact with living tissues the methæmoglobin is easily changed into oxyhæmoglobin, the nitrite disappearing at the same time, and that the former does not seriously interfere with the power of the blood to nourish the heart muscle. There is no cause to fear the production of methæmoglobin or injury to the blood from the medicinal administration of the nitrites. With regard to skeletal muscle tissue, the nitrite molecule in striated muscular tissue tends to decrease the contractile power and the duration of vitality. On involuntary muscle, both in cold-blooded and warm-blooded animals, the nitrites have a powerful paralyzing effect; this group causes a temporary paresis of the muscular structure contained in the arterial walls, and hence dilatation of the vessels. On the heart muscle the effect is much the same as on the contractile tissues of the vessels. The results of experiments show that the molecules of the nitrite group, in whatever combination, when present in even small quantities, tend to quicken the contractions of the heart, but also to weaken them. If the solutions coming in contact with the heart are very dilute, the quickening may make up for the weakened action, and the heart probably does as much, it may be more, work for a short time. Stronger solutions, after quickening, weaken, slow, and arrest the heart's contractions. But susceptible though the heart is to the influence of nitrites, the evil influence is very evanescent if the nitrite molecule be removed.

On the nervous system their influence is to depress the functions of the

nerve centres and nerves, but not to the extent which might be expected from their influence on the muscles, vessels, and heart. In toxic doses in animals they cause heaviness and apathy; in man, cerebral depression, probably due to their direct influence. In man other symptoms so far predominate that even from toxic doses no distinct indication of an effect on the spinal cord has been noticed. Locally, the nitrites do not have an analgesic effect. As regards the respiration it is believed that medicinal doses tend to stimulate it, or at least so far as the respiratory centre is concerned. The effect upon the pulmonary bloodvessels is not settled, although the author believes that the administration of the nitrites is followed by temporary dilatation of the vessels of the lungs, that the work of the right heart may be relieved by them, and that the good results in dyspnœic attacks may be the direct result of the relief thus given to the lesser circulation. The effect upon the digestive organs varies greatly: in some individuals they act as gastric irritants, causing sickness and diarrhœa; even if inhaled, the resulting stomach irritation and diarrhœa may be due to their excretion by the gastro-intestinal tract.

As far as concerns the urinary organs the result is again doubtful. They are, however, by the author, held in light esteem as diuretics, although they possess the advantage of not irritating the kidneys. In considering the therapeutic application of the nitrites three points are worthy of note: 1. The minute quantity which may influence the vascular system and, as a consequence, certain functions of the body—one-eighth of a grain of sodium nitrite, a small but uncertain fraction of a minim of ethyl nitrite, one sixteen-hundredth of a grain of nitroglycerin. 2. Notwithstanding their potency, even large quantities do not cause death. 3. The action of the nitrites is very evanescent. The class of cases in which these remedies will be of the most utility are those in which the heart is embarrassed in its work owing to a want of due relationship between its power and the calibre of the vessels through which it transmits blood. In angina pectoris it is probable that the increased tension is the cause of suffering, and in its reduction by the use of nitrites the object is threefold: 1. To relieve pain as rapidly as is possible. 2. To avert a fatal termination. 3. To prevent a recurrence of the pain. To relieve the urgent pain and its concomitant danger the fatty nitrites should be inhaled, of which an example is amyl nitrite, although it is impure as now found. The amyl nitrite may fail: 1. If the paroxysms are due to neuralgia of local origin; or it may be reflected or hysterical, and circulatory changes have but little part in its production. 2. Because of the short duration of its action, it does not break the spell of the vessels' contraction. 3. The person may be insusceptible to its influence. 4. The case may be an advanced one which would have been relieved at an earlier stage. In these cases the nitrites whose effect is more lasting should be tried. Of these, nitroglycerin is by far the best, as it reduces tension more quickly than either the sodium or ethyl nitrite. For the prevention of dyspnœa connected with other forms of cardiac, and with pulmonary disease the nitrites are of great service. They are naturally more useful in mitral disease, since here paroxysmal dyspnœa is more frequent than in aortic troubles, but aortic incompetence is no bar to their administration in small quantities when breathing is oppressed. In valvular disease, as in simple

dilatation, weakness and irregularity of the heart's action need not be taken into account in giving small doses for dyspnœic attacks; such doses do no harm, even if they do no good. Syncope as the result of the failure of the heart to supply the cerebrum with a due amount of blood—and to this condition arterial failure and lowered tension contribute—might appear to be a contra-indication to the use of the nitrites; in some cases it is apparent that they may be useful. Since no bad effects have been recorded, the use of small doses appears to be well justified. In cardiac failure good results have followed, but the difficulty is to graduate the amount of the drug to the necessities of the case. In pulmonary dyspnœa the result is rather uncertain; at times the symptom is benefited whilst the physical signs are unchanged. When abundant moist râles are present and dyspnœa is due to an accumulation of mucus rather than to spasm of the tubes or vessels, they are likely to fail. In uræmic dyspnœa the results have been, at times, disappointing. Although their use has been found to be advantageous, yet they have often failed. In some cases the necessary dose may be large. In migraine and headache these drugs have been much employed and considerable success has been recorded from their use. In migraine they are of more use when the face is pale and the pulse tense. The cases must be those in which there is distinct evidence of high vascular tension.—*The British Medical Journal*, 1893, Nos. 1695, p. 1305; 1696, p. 4; 1697, p. 56; and *The Lancet*, 1893, No. 3646, p. 123.

MEDICINE.

UNDER THE CHARGE OF

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Auto-intoxication from the Gastro-intestinal Tract.

In a communication recently presented to the Vienna Medical Club, Katz (*Wiener medicin. Presse*, 1893, No. 28, p. 1093) undertakes to point out the inadequacy of the assumption that the many symptoms presented by individuals suffering with chronic affections of the stomach and intestines depend upon auto-intoxication from the gastro-intestinal tract, and defends the view that ascribes these symptoms to mechanical and reflex influences. The argument is as follows: Among the products of abnormal gastric fermentation butyric and lactic acids are not generated in quantities large enough to produce symptoms of intoxication, as the organism upon which their development

depends cannot survive in strongly acid solutions. Even in the case of a greatly dilated stomach the dilution is so great that no harm results from the presence of an excess of acid. That the lactic acid formed and taken up by the system is disintegrated is indicated by the fact that the acid does not make its appearance in the urine. The same applies to butyric and acetic acids. Even in cases of hyperchlorhydria the concentration of the acid is not sufficient to cause intoxication. Basic products would not be produced in the stomach unless there were a marked deficiency of hydrochloric acid. Salkowski has shown that the peptotoxin of Brieger (which is but feebly, if at all, toxic) is not generated if pure reagents are employed and if accidental putrefaction is guarded against. In the intestine, likewise, the fatty acids and the aromatic products, the phenols, indol, and skatol, are developed in but small amount. The aromatic bodies would have a tendency to exert an antiseptic influence. Ptomaïnes have seldom been found in the feces, and it is more than probable that they are never formed in the healthy intestine, as they have hitherto only been found in states of abnormal or unusual nitrogenous metabolism, such as occurs in connection with cystinuria, and in case of grave infectious diseases, such as cholera. Thus far, chemical investigation has failed to furnish evidence of the occurrence of auto-intoxication from the gastro-intestinal tract. The varying toxicity of the urine is not more demonstrative, and clinical evidence is likewise not more convincing. The transient sense of fatigue, the dyspnœa, the palpitation, the vertigo are readily to be explained by mechanical and reflex processes, for these symptoms usually bear some relation to the ingestion of food and the processes of digestion. This view receives support from the fact that the symptoms occur especially in neurotic persons and largely in women. Therapeutically, also, the best results are not obtained from the administration of antiseptics, but rather from agents that stimulate peristaltic activity.

Amœbæ in the Urine.

Posner (*Berliner klin. Wochenschr.*, 1893, No. 28, p. 674) has reported the case of a well-built musician, thirty-seven years old and previously healthy, who was suddenly seized with a chill, followed by a sense of malaise and the appearance of blood in the urine. The only known possible cause for the condition was exposure to cold and wet. The patient was pale, but temperature and pulse were normal, and there was no œdema and no evidence of a heart lesion. Chemical examination confirmed the accuracy of the belief that the urine contained blood, and microscopic examination of the sediment obtained by centrifugation disclosed the presence of numerous bodies constituted of granular protoplasm, and about eight or ten times as large as colorless blood-corpuscles. These contained one or more somewhat oval nuclei, vacuoles, and foreign matters, more particularly red blood-corpuscles. The bodies were plump in form and could be observed to change their shape. Some presented long, delicate processes. The urine contained, besides, red and colorless blood-corpuscles, renal epithelium, and hyaline and granular and blood casts. Rest in bed, and a milk diet were prescribed, and in the course of a few days the amœbæ and the blood gradually disappeared from the urine, although the albumin and tube-casts persisted. For a week the

patient felt quite comfortable. Then there occurred a second paroxysm attended with symptoms like those of the first and lasting for two days. Seven weeks later there occurred a third, and two months after this a fourth paroxysm—on each occasion the presence of amœbæ coinciding with the occurrence of the hæmaturia. A fifth attack occurred eight months after the fourth. The urine gradually cleared up and the patient became quite free from symptoms. There was no evidence of cystitis, and cystoscopic examination failed to disclose any abnormal condition of the bladder, while the presence of tube-casts indicated the kidneys as the source of the amœbæ. The suddenness of onset of the symptoms, in association with the occurrence of a chill, suggested the entrance at this time into the circulation of a new generation of amœbæ or of their spores, but examinations of the blood failed to disclose the presence of abnormal constituents. The only conclusion left is that the organisms reached the kidney from the bladder. The organisms found in the urine were larger than ordinary amœbæ coli and there was not, at any time, any manifestation of intestinal derangement.

The Constitution of the Blood.

At the recent Congress for Internal Medicine, held at Wiesbaden, Stintzing (*Wiener medicin. Presse*, 1893, No. 28, p. 1118) reported the results of examinations, made in conjunction with Gumprecht, of the blood obtained from the tip of the finger in 100 cases. It was found that the density of the blood, the amount of hæmoglobin, and the amount of solids bore no constant relation to one another, but that at times a notable disproportion existed. The blood of man normally contains on the average from 78.3 to 79.8 per cent. of water; variations of from 1½ to 2 per cent., however, being quite common. Under abnormal conditions the proportion of water may be augmented more than 10 per cent. In cases of anæmia the proportion of solids may fall so low as 11 per cent.; under such circumstances hydræmia will always be present. Copious libations of water, such as take place in cases of diabetes, have little or no influence upon the proportion of water in the blood. In cases of typical chlorosis the diminution in the amount of hæmoglobin appears to be associated with a diminution in the proportion of solids, slighter than that which takes place in cases of anæmia; it may be that in chlorosis the hæmoglobin is replaced by other substances. In cases of leukæmia the diminution in the amount of solids is likewise relatively slight, evidently as a result of the increase in the number of colorless blood-corpuscles.

A Case of Motor Agraphia, with Autopsy.

At a recent meeting of the Société de Biologie, Charcot and Dutil (*Compt.-rend. hebdom. des Séances de la Soc. de Biol.*, 1893, No. 24, p. 130) reported the case of a woman who, at the age of forty-four years, was stricken with right hemiplegia, associated with paralysis of the tongue. At the end of a reasonable time speech and movement returned, but it was observed that the ability to write spontaneously was lost. The pen could be held perfectly well; the idea of what the woman wished to write could apparently be formed; and the visual conception of the orthography of the words was pre-

served, but ideas of the letters could not be aroused; the forms of the letters could not be recalled. It was known that the woman could write previously to this seizure, and subsequently the ability to read was preserved. At the age of fifty-five years, left hemiplegia and complete loss of speech occurred. Paresis of the left side remained, but after the lapse of two years speech was regained. At the age of sixty-one years a third attack occurred, which was followed by simple embarrassment of speech, with transitory difficulty of articulation. Soon afterward a fourth attack occurred, with complete and permanent loss of speech. Thereafter there developed a pseudo-bulbar glosso-labio-laryngeal paralysis. The patient had to be nourished by means of the tube. On laryngoscopic examination it was found that the vocal bands failed to approximate in attempts at phonation. There was neither word-deafness nor word-blindness. The patient had no difficulty in pointing out objects named by language or in writing. She could transcribe from a copy, either written or printed, but could not write spontaneously or from dictation. It thus appeared that the visual image, the auditory image, and perhaps also the motor image of articulation were preserved, but the mechanism by which thought was transferred into written language was wanting. The condition of the woman continued thus, unchanged, until death took place, at the age of sixty-nine.

Upon post-mortem examination two foci of yellow softening were found in the cortex of the left hemisphere. The one was circular in outline and rather smaller than a dime, and occupied the posterior extremity or foot of the second frontal convolution; the other was much more extensive and triangular in outline. It involved the lower half of the middle third of the second frontal convolution and the foot of the third frontal. Posteriorly and inferiorly this arc of softening extended deeply into the inferior extremity of the ascending frontal convolution; elsewhere, however, it was superficial. The external surface of the right hemisphere presented three foci of softening. The largest area, almost as large as a silver half-dollar, was situated at the inferior extremity of the ascending frontal and parietal convolutions. A second focus was situated in the posterior portion of the middle of the third of the ascending parietal convolution. The third focus was as large as a pea, and situated at the anterior extremity of the third frontal convolution. The inferior surface of the right hemisphere also presented two foci of softening. The larger occupied the middle portion of the first and second temporo-occipital convolutions. The other was situated upon the inferior surface of the frontal lobe. The destruction of the inferior extremity of the left ascending frontal convolution and of the inferior extremity of the right ascending frontal and parietal convolutions explains the pseudo-bulbar palsy. The lesion of the right ascending parietal corresponds with the paresis of the left superior extremity; that of the foot of the left third frontal with the aphasia of articulation, which was masked by the pseudo-bulbar palsy. The lesions at the base of the brain probably gave rise to no symptom. The agraphia is thus to be referred to the lesion of the foot of the left second frontal convolution. The conclusion is expressed that in addition to agraphia of sensory origin (from destruction of the centre of verbal vision or interruption of the fibres connecting this centre with the motor centre of the upper extremity) there is a form of motor agraphia which bears the same relation to written

language as logoplegia (from a lesion of the left third frontal convolution) bears to spoken language. The condition may be defined as an amnesia of the co-ordinated movements for writing. The case reported would seem to demonstrate that the centre for the co-ordination of the movements concerned in writing is situated at the foot of the left second frontal convolution.

M. DÉJÉRINE, in the discussion that followed the report of the case, stated that with the existence of a lesion in the left third frontal convolution, the existence and the localization of a purely motor agraphia seemed scarcely justified. Disturbances of the faculty of writing are common in aphasia of motor or sensory origin dependent upon cortical lesions in the zone of language, and are only wanting in the aphasias resulting from lesions seated without this zone—subcortical motor aphasia, pure verbal deafness and verbal blindness. The hypothesis of a special centre for the movements of writing is scarcely reconcilable with the fact that writing may be performed with the feet. To demonstrate the isolated existence of a motor agraphia it would be necessary to have a case of cortical motor aphasia with integrity of the faculty of writing and a case of agraphia from a lesion of the left second frontal convolution with integrity of speech.

PAIN OF VISCERAL DISEASE.

HEAD has published (*Brain*, Parts I. and II., 1893, pp. 1–133) a most careful and elaborate study of the external areas of pain and disturbed sensation connected with disease of the different viscera, together with diagrams and illustrations that practically summarize the results of the study. He finds that the tender areas in visceral disease and the areas affected in herpes zoster correspond in that (1) they have the same distribution; (2) they do not overlap; (3) they have the same maxima. As herpes probably depends on inflammation of posterior roots, these areas are not to be referred to distribution of special nerves, but to distribution of nerves connected with certain spinal segments.

The reference of pain to the skin when the lesion affects an internal organ, is compared with the phenomenon known as allocheiria, and the explanation of both phenomena is held to be the law that when a painful stimulus is applied to a part of low sensibility in close central connection with a part of much greater sensibility, the resultant pain is felt in the highly sensitive part, rather than in the part of low sensibility directly acted upon. Cutaneous tenderness in visceral disease is ascribed to the fact that the impulses passing by sensory nerves from a diseased organ to a certain segment of the cord set up the disturbance there, so that any additional disturbances due to impulses coming from the skin are modified, usually exaggerated, and thus produce at the center abnormal and, as a rule, painful impressions.

The original work should be consulted, but some idea of the results may be gained from the lists of names given below.

A forthcoming paper, "The Head and Neck," will be devoted to the fifth, sixth, seventh, and eighth cervical segments, which are of special importance.

The present paper maps out—

D 1, the "Dorso-ulnar," or first dorsal area.
D 2, the "Dorso-brachial," or second dorsal area.
D 3, the "Scapulo-brachial," or third dorsal area.
D 4, the "Dorso-axillary," or fourth dorsal area.
D 5, the "Scapulo-axillary," or fifth dorsal area.
D 6, the "Subscapulo-infra-mammary," or sixth dorsal area.
D 7, the "Subscapulo-ensiform," or seventh dorsal area.
D 8, the "Middle epigastric," or eighth dorsal area.
D 9, the "Supra-umbilical," or ninth dorsal area.
D 10, the "Sub-umbilical," or tenth dorsal area.
D 11, the "Sacro-iliac," or eleventh dorsal area.
D 12, the "Sacro-femoral," or twelfth dorsal area.
L 1, the "Gluteo-crural," or first lumbar area.

(The second, third, and fourth lumbar segments are not primarily represented in visceral disturbances.)

L 5, the "Fibulo-dorsal," or fifth lumbar area.
S 1, the "Soleal," or first sacral area.
S 2, the "Sciatic," or second sacral area.
S 3, the "Gluteo-pudendal," or third sacral area.
S 4, the "Coccygeal," or fourth sacral area.

In diseases of the	Tenderness is found over areas
Heart	D 1, D 2, D 3.
Lung	D 1, D 2, D 3, D 4, D 5.
Stomach	D 6, D 7, D 8, D 9.
Intestine	D 9, D 10, D 11, D 12.
Rectum	S 2, S 3, S 4.
Liver and gall-bladder	D 6 (?), D 7, D 8, D 9, D 10.
Kidney and ureter	D 10, D 11, D 12, L 1.
Bladder (mucous membrane and neck)	S 1 (?), S 2, S 3, S 4.
Bladder (overdistention and inefficient contraction)	D 11, D 12, L 1.
Prostate	D 10, D 11, D 12 (?), L 5, S 1, S 2, S 3.
Testis or ovary	D 10.
Epididymis, or uterine appendages	D 11, D 12, L 1.
Uterus (in contraction)	D 10, D 11, D 12, L 1.
Uterus (lower segment and os internum)	S 1 (?), S 2, S 3, S 4.

A Case of Addison's Disease, with Note on Metabolism.

Kolisch and Pichler (*Centralblatt für klinische Medicin*, 1893, No. 12, p. 249) have reported the case of a man, twenty-nine years old, of good family history, who eight years previously had had some febrile affection, attended with night-sweats, but without conclusive evidence of the existence of pulmonary tuberculosis. Subsequently he suffered with digestive derangement, attended with vomiting, but without noteworthy loss of flesh. Within two years, however, following the death of a relative, there had been pro-

gressive loss of strength, with readiness of fatigue after slight mental or physical exercise, and pronounced emaciation. There was no colic, but the digestion was deranged and flatulence and constipation were present. Simultaneously with the emaciation, the skin was noticed to become universally darker, but more decidedly so in certain circumscribed areas. At first a dark patch appeared upon the lower lip, which was followed by others upon the abdomen, the genitalia, the dorsa of the hands, and the forehead. There was no history of syphilis and none of alcoholic excess. The skin was dry; the temperature was normal; there was no œdema. There was considerable diminution in the proportion of hæmoglobin in the blood; the number of red corpuscles was moderately diminished, while the colorless cells showed no material change. There were signs of slight condensation at the apex of the right lung. Heart and urine presented no abnormality. While under observation slight petechial hemorrhages were observed to take place beneath the mucous membrane of the cheek, leaving the overlying epithelium intact. These extravasations were of short duration, but were frequently repeated. As great diversity exists among the reports as to the metabolism in cases of Addison's disease, examinations were made to determine the relation between ingestion and excretion. It was found that the assimilation of both nitrogen and fat and the disintegration of albumin did not materially differ from these processes as they take place in a healthy person; if anything, there was a tendency to the accumulation of albumin.

Sub-diaphragmatic Gaseous Abscess; Operation; Recovery.

Vanlair (*Revue de Médecine*, 1893, No. 7, p. 561) has reported the case of a child, six years old, that was suddenly seized with a chill, followed by fever and the development of acute abdominal pain, most marked in the epigastrium, together with tympanites and diarrhœa. Soon afterward there developed pronounced polypnœa, though without subjective dyspnœa, without cough, and without abnormal auscultatory phenomena. There was at this time no evidence of the existence of a peritoneal effusion. In the following days the temperature continued to rise, and on the tenth day, in the absence of pleurodynia, a feebleness of the breath sounds at the base of the right lung became evident, with diminished vocal resonance and fremitus, and without râles. At the same time a resistant and painful tumor was observed in the epigastrium, the percussion note over which was dull. It soon became apparent that an effusion of fluid had taken place into the peritoneal and right pleural cavities. A little later broncho-pneumonia developed at the base of the left lung. The fever became irregular; afternoon chilliness was followed by pyrexial exacerbations. The abdominal tumefaction grew tense. Pallor and emaciation were pronounced. After the lapse of several days more the percussion note over the centre of the epigastric tumor became tympanitic—dulness, however, with an increased sense of resistance, persisting at its periphery. Over the central portion there was also to be heard a to-and-fro murmur of metallic timbre, synchronous with the respiratory movements. A few days later, in the absence of signs of a pulmonary cavity and in the absence of an attack of cough, the signs of a pneumothorax appeared at the middle of the lateral aspect of the right chest. A thrombus also

formed in the left femoral vein, coincidently with the appearance of a hard, painful, subcutaneous tumor above Poupart's ligament and corresponding to the point of emergence of the epigastric from the external iliac vein. Surgical intervention was now determined upon. When the abdomen was opened by an incision over the epigastric tumor, there escaped first almost pure pus, then brownish liquid of fecal odor. There was also an escape of gas synchronously with the respiratory movements. It was found that there existed an irregular cavity, bounded above by the diaphragm, below and behind by the transverse colon and the liver, below by the omentum adherent to the anterior abdominal wall. The walls of the cavity were lined by false membrane. The cavity was found to communicate with the transverse colon by means of a small perforation, and with the right pleural cavity through a second and larger perforation of the diaphragm. The opening in the colon was sutured; a drainage-tube was introduced through the diaphragmatic opening into the right pleural cavity and the peripheral extremity brought out through a button-hole by the side of the abdominal incision. A counter-opening was also made at a point low on the lateral aspect of the right chest and a drainage-tube introduced. A physiological saline solution was passed through the drainage-tubes and the epigastric wound was packed with iodoform gauze. The little patient bore the operation admirably. The temperature afterward fell; the appetite improved; and there was generally marked improvement. The secretion from the pleural cavity lessened and assumed a better character. The sutures in the colon, however, did not hold and there was some slight oozing of fecal matter. By means of a third drainage-tube the contents of the colon were diverted from the cavity externally. Local and general improvement was now more marked than it had been. The thoracic opening gradually closed and the drainage-tube was removed. At a later date, however, there was evidence of the formation of a pleuro-pulmonary fistula. The swelling in the groin also underwent softening and threatened to rupture. A final complication was the occurrence of two violent eclamptic attacks. Nevertheless the several fistulæ ultimately closed and the child recovered perfectly.

Peculiar Odor of the Breath of Tuberculous Patients.

Rosenbach (*Aerztl. Prakt.; Wiener med. Presse*, 1893, No. 28, p. 1114) has called attention to a peculiarity of the breath of tuberculous patients, slightly resembling that of mild cases of putrid bronchitis, but differing from this in having a disagreeably sweet quality. It may become apparent in the neighborhood of the patient even in the absence of expectoration, and it adheres to the expectorated matters but feebly, probably because it is dependent upon the presence of volatile substances. It is only present in the exhaled air and thus becomes most evident when the patient coughs or breathes with open mouth. This sign is of unfavorable prognostic significance, even though the remaining manifestations in the case appear favorable. It is often present when the destructive process is not marked, and is most pronounced when the physical signs are unobtrusive. It is almost always an associated manifestation of disseminated broncho-pneumonic consolidation. It is wanting in cases of extensive infiltration and when cavities have formed, and also when the sputum is copious. In a large number of cases in which this symptom

was observed hæmoptysis occurred. Night-sweats, anorexia, and febrile exacerbations were also frequently noted. The phenomenon is of diagnostic significance, as it early indicates the occurrence of a morbid process in the lungs. The author therefore recommends that, in all doubtful cases in which pulmonary tuberculosis is suspected, the odor of the breath be investigated. If there be uncertainty as to the character and origin of a given odor, it is well to insure a thorough cleansing of the mouth and teeth, to exclude a possible source of error.

Renal Tuberculosis.

Tuffier (*Annales des Malad. des Org. Génito-urin.*, 1893, No. 7, p. 495) points out that in addition to hydronephrosis of tuberculous origin, there is also a variety of renal tuberculosis characterized by paroxysmal pain indistinguishable from that of nephritic colic, without detectable enlargement of the kidney and without pyuria or hæmaturia, although it may be possible to find tubercle bacilli in the urine. Besides this form of renal tuberculosis there is another, characterized by the occurrence of hæmaturia and corresponding to the form of pulmonary tuberculosis attended with hæmoptysis. A case is reported in a woman, forty-two years old, of good family and personal history, who, in September, 1888, after a long walk, not especially attended with fatigue, was suddenly seized with hæmaturia. There was no pain, but a sense of burning referred to the bladder. The urine soon resumed its normal appearance. Thereafter, the hæmaturia was repeated from time to time, after intervals of varying duration in which the urine appeared quite normal. The woman became extremely anæmic, almost cachectic in appearance, and weakness became marked. The urine examined in an interval between two attacks presented no abnormality. The physical examination was facilitated by the marked emaciation, but it was not possible to detect any enlargement or lesion of kidney, ureter, or bladder. The manipulation was unattended with pain. The patient at this time would not submit to a cystoscopic examination. Examination of heart, lungs, and other viscera failed to disclose the existence of organic disease. Upon the strength of the evidence it was concluded that there must be a neoplasm of the kidney or of the bladder, the character of the hæmaturia pointing to the bladder. Accordingly the bladder was opened through a hypogastric incision and explored, but no lesion was found. The wound of operation closed readily and without untoward event; but after the lapse of two months there developed in the course of the cicatrix a small spot of fungous ulceration, of the tuberculous nature of which there was no doubt. Shortly afterward hæmaturia recurred, and now a diagnosis of renal tuberculosis was ventured. The right kidney appeared to be a little the larger, but the left was slightly painful. Cystoscopic examination yielded a negative result; for the patient was greatly agitated and, perhaps as a result of spasm, not a drop of blood escaped from either ureter during a period of ten minutes. A second examination, however, showed clearly that the blood came through the left ureter, while the secretion of the right kidney appeared to be normal. In view of the gravity of the situation, it was determined to operate at once and incise and scrape the kidney or excise it, according to the conditions found. No

change was found in the tissues surrounding the kidney. The organ itself was not enlarged, but within its parenchyma several fluctuating areas of softening were found. No enlargement of adjacent lymphatic glands was detected. The organ was removed. There was no surgical complication, and five weeks after the operation the patient appeared to be perfectly well. Tubercle bacilli were found in the contents of the abscesses. There was, however, no communication with pelvis or ureter.

Idiopathic Muscular Atrophy of Facio-Scapulo-Humeral Type in a Boy Seven Years Old.

Prautois and Étienne (*Revue de Médecine*, 1893, No. 7, p. 635) have reported the case of a child, seven years old, without neuropathic heredity, born at term after a normal labor, and nourished at the breast for a year, that in early infancy presented non-suppurating adenitis, ciliary blepharitis, and bilateral cataract (for which operation was performed). There had been sore-throat at the age of a year, but at no time fever or convulsions. The child began to walk at the age of seventeen months, but had some difficulty in standing on its feet. The gait was waddling and it would fall frequently. The boy was intelligent; he readily learned to read and to write; he promptly answered questions; his memory was good. He was sufficiently developed for his years, though there was some degree of cranial asymmetry, the occiput being the more prominent upon the right. There was evident a generalized muscular atrophy, predominating, however, in certain groups of muscles, giving rise to a peculiar facies, a drooping of the right shoulder, lumbar lordosis with compensatory dorsal kyphosis, left-sided pes equino-varus. The face was puffy and expressionless, the mouth held open, the upper lip prominent and thickened, the labial commissure depressed, the naso-labial fold obliterated. From time to time there occurred simultaneous movement in the left half of the upper lip and the orbicularis palpebrarum. There was an inability to raise the upper lip and to evert the lower lip. Whistling could only be accomplished by inspiration. When the child laughed or cried the physiognomy remained unmoved. The eyes could be closed but imperfectly. The functional integrity of the masseter muscles was preserved. There was little atrophy of the cervical muscles, all movements being possible. The clavicular portion of the trapezius was preserved. There was slight atrophy of the supraspinatus and infraspinatus, the latissimus dorsi and the pectorales. The adductor portion of the trapezius was profoundly wasted. The scapulæ stood out like wings. The serrati magni were atrophied. The deltoids and the muscles of the arm were atrophied. The muscles of the forearm were affected in less degree. The long supinators were uninvolved. The muscles of the hand escaped. The lumbar muscles and those on either side of the vertebral column were atrophied. The glutei were diminished in volume. The muscles of the thighs were less affected. The calves were full but soft. The anterior muscles of the leg had almost entirely disappeared, especially upon the right side. Motility was greatly deranged. The patient was unable to arise from the dorsal decubitus without first turning upon his side and using the arms for support. In changing from the erect to the kneeling posture the body was bent forward, the hands placed

upon the thighs, the knees being then suddenly depressed, with the arms held in front and support being afforded by the hands. In arising from the knee-chest position a lateral movement was made until one hand and then the other was applied to the thighs, the erect posture being attained by a sudden final movement. In walking, the lumbar lordosis was exaggerated and the body was thrown backward, the alternate action of the abductor causing the gait to be waddling. The muscles were flabby, but did not present fibrillary contractions. As well as could be determined in so young a subject there was no reaction of degeneration. The reflexes were abolished. Sensibility was preserved in its various forms. The noteworthy features of the case are the early age at which the symptoms were first observed; the asymmetry of the shoulders; the asymmetry of the head; the relation between the atrophy and the electric reactions on the one hand and, on the other hand, the rapidity and embryologic relations of the course of the atrophy, the muscles that were most atrophied being those that develop earliest, while the muscles whose development is normally slow were least affected; the absence of discoverable heredity.

SURGERY.

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THE RADICAL CURE OF SPINA BIFIDA, WITH LARGE OSSEOUS DEFICIENCY, BY OSTEOPLASTY.

ROCHET describes the following case (*Archives Provinciales de Chirurgie*, 1892, i., No. 6): Margaret X., aged three and one-half years, had a spina bifida in the cervico-dorsal region about the size of a small orange. It was not pedunculated, but was attached by a large base; the skin over the tumor was thick. There were no convulsive or paralytic phenomena, but there had been a tendency to fainting. There was no hydrocephalus, the sutures were closed, the frontal region was prominent.

Operation. A vertical incision 10 cm. in length was made over the tumor and an attempt made to dissect up lateral skin flaps, but the sac was so adherent to the skin that it was accidentally opened, when a quantity of clear fluid escaped. The nerve roots could be seen at the bottom of the cavity, and the cord in its natural position. The latter was about the size of a goose-quill. After dissecting the sac from the skin it was resected at the junction with the vertebral fissure, the long axis of which measured one and one-half centimetres. The arches were then fractured near their bases on either side,

as advised by Dollinger (1886), brought together in the median line and sutured together. Deep and superficial sutures completed the operation. Recovery followed without incident. Senenco operated after Dollinger's method, and at the end of three to four months the bony case seemed complete.

BERGER operated successfully in the case of a child seven weeks of age by transplanting a plate from the scapula of a young rabbit.

No notable accidents have followed the excision of these tumors.

BELLANGER reports eleven cases in which nervous filaments of variods sizes were cut during the operation without any paralytic or anæsthetic phenomena resulting. This observation, originally made by Terrier and Kirmisson, is not the exception, but the rule.

There is nearly always a considerable discharge of fluid when the sac is opened; this constitutes one of the great dangers of the operation.

If the tumor has a narrow pedicle it may be treated conservatively. The author prefers the elastic ligature to puncture and iodine injection, although the latter has given very good results, and is well recommended by the English Commission of 1882. If the pedicle is thicker than a penholder excision is called for.

It is advised, when possible, to isolate any nervous trunks that may be found traversing the inner surface of the sac, and restore them to the medullary canal before excising the sac; at the same time attention is called to the fact that in many cases these structures only appear to be true nerves, but have in reality no physiological nervous function, and if it is necessary to cut them no harm will result.

Rochet doubts the value of the simple deep sutures, and recommends the osteoplastic method of closing the defect in all cases.

A CASE OF PNEUMONECTOMY.

LAWSON reports (*British Medical Journal*, 1893, No. 1692) the following case: Mrs. F., aged thirty-four years, had suffered with dyspepsia for fifteen years, and for the past year with pain at the apex of the right lung. She had lost much flesh; there was a short cough, and she perspired freely at night. Her pulse averaged 112, and the evening temperature was 2° to 3° above normal. There were pronounced signs of consolidation at the right apex. As she grew gradually worse under treatment, Lawson concluded to remove the diseased portion of the lung.

An incision was made along the second rib from mid-sternum almost to the anterior axillary fold. The intercostal muscles were separated from the second and third ribs, and the pleura detached from the inner surfaces. By means of a fine saw the ribs were divided at each extremity of the incision. A trocar, connected with a Junker's bottle and bellows, was introduced through the pleura, and air was thus pumped through a hot, strong carbolic solution into the chest. After the lung had collapsed the pleura was incised. There were numerous firm adhesions which had to be torn through before the apex of the lung could be brought out. Finally this was accomplished, the lung was transfixed below the disease by a long needle carrying a sterilized silk thread, and the apex tied off with a Staffordshire knot. The portion

removed was half the size of the fist, and contained a dense tuberculous mass. The stump was rubbed with powdered iodoform, the cavity sponged out, the lung dropped back, and the external wound closed without drainage. Convalescence was satisfactory until the fourth day, when a dry pleurisy developed on the left (sound) side. This passed by, and all went well until the end of the second week, when the temperature record showed an invariable evening elevation, and there was acceleration of the respiratory rate. This continued until the expiration of a month after operation, when a sudden discharge of chocolate-colored fluid from the wound occurred. A rubber tube was introduced and the cavity aspirated. The temperature after this time remained normal, but the discharge became purulent, although it has steadily decreased in amount.

At the time of writing the patient was walking about her room, she had improved rapidly in appetite and in flesh, and was about to go to her home.

The operation presented no difficulties, chloroform was the anæsthetic employed, and no dyspnœa or cyanosis occurred. The author believes it would have been best to have introduced a drainage-tube for a couple of days. One great difficulty will be to determine the cases that are suitable for pneumonectomy. It is said that in the living collapsed lung foci of disease are readily detected by palpation, and many portions might be ligated and removed if necessary.

The Use of Oil of Cinnamon as an Antiseptic in Surgery.

In the *Journal de Médecine et de Chirurgie pratiques*, 1893, No. 11, Dr. Just Championnière extols the antiseptic value of oil of cinnamon. The attention of the author was first called to the antiseptic properties of the essential oils by the work of M. Chamberland, in 1887. The ideal antiseptic should be efficient and yet be free from irritating qualities; it should not be poisonous nor possess a disagreeable odor. After numerous experiments with the various volatile oils, Championnière found that the oil of cinnamon was the most active, very closely approaching corrosive sublimate as a microbicide.

Considerable difficulty was experienced in obtaining a preparation of the oil free from irritating properties. When combined with rétinol, however, it was found to be free from this objection. The following formulæ have proven quite satisfactory:

℞.—Rétinol	75 grammes.
Sterilized wax sufficient to make of a proper consistence.	
Cinnamon oil	1 gramme.

Or,

℞.—Rétinol	75 grammes.
Sterilized wax	25 "
Cinnamon oil	1 gramme.
β-naphthol	1 "

The oil must have been recently re-distilled. The preparation is spread on lint and applied to the wound. The author has employed this preparation in cases of laparotomy, radical cure of hernia, excision of the breast, etc.,

and he claims that extensive wounds, even those which are drained, may be kept in a very satisfactory state of antisepsis.

Advancement of a Portion of the Superior Maxillary Bone in Cases of Hare-lip with Anterior Cleft of the Hard Palate, for Correcting the Deformity of the Ala Nasi.

In the *Medical Record*, New York, 1893, No. 25, Wyeth describes an operation which he has devised for correcting the deformity of the nose in cases of hare-lip with a cleft of the alveolar arch. In these cases, after the most perfect plastic operation, the wing of the nose on the side on which the deficiency existed remained flattened. To correct this, the author divides the alveolus of the short side with a pair of bone-forceps, at about its middle, and forcibly advances the anterior segment until it meets the opposite side in front, and sutures it in this position. This places the bony foundations of the alæ nasi and nasal cartilages of the two sides upon a level, thus restoring the symmetry of the nose.

At least eight weeks should elapse before the attempt is made to close the lip. In the cases reported the results were entirely satisfactory.

Costal Resection in the Treatment of Cold Abscesses of the Thorax.

Dayot presents the results of his observations (*Archives Provinciales de Chirurgie*, 1892, i., No. 5) on this subject. He has endeavored to settle two questions: 1, the pathological anatomy of these abscesses; and 2, the best method of operative treatment. The author used the iodoform-ether treatment, and in one case obtained a definite cure, but the method is not recommended. The cases treated by incision and erasion all had fistula remaining.

The author had the opportunity of performing an autopsy on a case with subcostal abscess and intercostal diverticula. A rib was found denuded. This led him to the belief that these abscesses usually had their origin in disease of the ribs, and he accordingly practised resection in the cases subsequently coming under his care. Five observations are given, in every one of which osseous lesions were found.

Dayot concludes that the relative frequency of osteitis and periostitis of the ribs coincides with the same lesions elsewhere—that is, osteitis is much the more common.

Resection of the rib over the abscess is invariably indicated. If the diagnosis is doubtful, the same proceeding is advised as an exploratory operation. Absolute antisepsis should be employed. Zinc chloride 1 : 10 is used to brush over the wall of the sac. Drainage with iodoform gauze is recommended. The following conclusions are given:

1. Cold thoracic abscesses arise as least as frequently, if not more so, from costal tuberculous osteitis as from external periostitis.

2. It is necessary to look for this condition, otherwise it may pass undetected, and it can often only be recognized by costal resection.

3. The absence of augmentation of tension during coughing will not elimi-

nate deep abscess. The condition must always be borne in mind and looked for, and the best method is by costal resection.

4. Costal resection applied to cold abscess of the thorax, whatever may be the condition of the rib, is the type of a complete intervention. The operation is simple and free from danger.

Varicose Ulcerations of the Rectum and Anus.

In the *Revue de Chirurgie*, 1892, No. 12, Quénn writes on this subject. No other mucous membrane is so frequently the seat of ulceration as that of the ano-rectal region. Ulcers here may occur in the course of a general affection, as tuberculosis, dysentery, syphilis, Bright's disease. Perhaps more frequently they result from purely local causes, such as soft chancre, mechanical obstruction, or disintegration of a neoplasm. Besides these symptomatic, constitutional, and venereal ulcers, a variety is met with that merits the title "simple ulcers of the rectum."

Simple ulcer is most frequently limited to the region of the sphincter; at times, however, it may be situated higher in the rectal mucosa. The most common of the simple ulcers in the sphincteric region is the ordinary fissure-in-ano. Along with this may be classed the irritable and painful ulcer of Allingham, and the varicose ulcer. According to Allingham, irritable ulcer differs from the simple variety by being round in shape, and by the high situation of the former, which may even be within the internal sphincter. Chronic varicose ulcer was first described by Rokitansky. It is always found in connection with hemorrhoids. In this variety there is less thickening of the borders and less pain than in fissure.

A person suffering from hemorrhoids is more prone than others to fissure, which may develop into a true ulcer. In women, exploration of the rectum is facilitated by introducing one finger into the vagina and pressing downward. As a further assistance the patient may be asked to bear down.

In simple ulcer above the sphincter, the lesion is round, the edges are thickened, the base unequal and red, and very vascular. The varicose ulcers are divided into the irritable and the non-irritable. The irritable variety includes the round ulcer, the painful and irritable ulcer of Allingham, and the more common fissure-like ulcer. The symptoms closely simulate those of fissure. The non-irritable variety includes the superficial ulceration of the mucosa, the small round ulcers, supra- or infra-sphincteric, and the larger ulcer of the margin of the anus, of Péan and Malassez. These are most common in middle and later life. The primary round ulcer is more particularly observed in the aged. The non-irritable varicose ulcer presents three principal symptoms: sensory disturbances, the discharge of mucus more or less purulent, and hemorrhage. The latter is the most important of these, and is at times profuse. The diagnosis depends upon detecting the presence of the ulcer, and determining its exact nature. Digital examination will detect a painful area. It is necessary to employ the speculum for ocular examination.

Syphilitic lesions of this region may belong to the primary, secondary, or tertiary stages. Hard chancre presents its usual characteristics. The lesions of the secondary period are mucous patches, and of the tertiary period, ulcers; the latter is rarely observed. Tubercular ulcers have been observed as

primary lesions and as secondary to pulmonary disease. According to Ball, they present large lesions in the rectal or ano-rectal mucous membrane; they are irregularly rounded and elongated in the vertical diameter; the borders are irregular and raw; the mucosa in the neighborhood is infiltrated and thickened.

The treatment differs with the seat and variety of the lesion. For fissure, the usual treatment suffices. Round ulcers of the margin of the anus require topical applications; they may be cauterized and dressed antiseptically or excised. Superficial erosions may be excised or cauterized. Supra-sphincteric ulcers require the galvano-cautery. Anæsthesia is necessary, and the use of the Sims speculum to give access to the lesion. Boric-acid lotions and iodoform tampons may be used in the after-treatment, and antiseptics, such as naphthol, administered internally.

Spinal Surgery.

Phelps reports (*Journal of Nervous and Mental Diseases*, 1893, No. 7) five cases upon which he operated. Two cases had Pott's disease; both died. One was a fracture of nineteen months' duration; the patient recovered and could walk; one case of old hemorrhage was much improved, and one case of spinal meningitis is reported cured.

Operation is advised in the following class of cases: gunshot wounds of the spine, tumors impinging upon the cord; spinal or cerebro-spinal meningitis (non-epidemic) as soon as dangerous symptoms of compression, which did not improve by treatment, appeared; in hemorrhages into and around the cord; invasion of the canal from burrowing of pus along great nerve trunks, producing purulent meningitis; abscess from diseased vertebræ; some forms of meningitis localized, and certain forms of tubercular meningitis.

Dr. Abbe has recently successfully operated on a case of syringomyelia.

In thirty-six cases of Pott's disease, operated upon by Schede, Horsley, Lane, and Macewen, about 30 per cent. were cured, 40 per cent. unchanged or but slightly improved, and 30 per cent. died as a result of the operation.

The neurologist can be of great assistance to the surgeon in deciding which cases are proper for operative interference, and when operation should be performed.

The author prefers the median incision, cutting off the tips of each vertebra, leaving them attached to the muscles, and removing the spines. A rongeur and bone-cutter are the best instruments to use. In septic conditions the wound should not be closed. A plaster corset should be applied over the dressing each time. Electricity improved the power of the muscles in three cases. The following conclusions are presented:

The outlook for the success of spinal surgery is not so gloomy as it has been painted.

Only incurable cases by other methods should be operated on; then, if one in fifty can be saved, it means much.

Operations in recent fractures and dislocations and gunshot wounds show a large mortality, because of the large number that would die even if an operation was not done. This should not deter the surgeon from operating. Cases that would certainly die, or recover hopelessly paralyzed, may be cured or saved by operation.

Finally, it would be an advantage if the study of spinal surgery could be conducted jointly by the surgeon and the neurologist.

Note on the Treatment of Acute Abscess.

Aikman (*Glasgow Medical Journal*, 1893, No. 6) has applied to the treatment of acute abscess the suggestions made by Mr. Arthur Barker in the *British Medical Journal*, 1891, vol. i., on the treatment of chronic abscess by scraping, flushing, and immediate suture. The latter observations have been confirmed by surgeons, and in suitable cases this is a valuable method of treatment.

In acute abscess, although the conditions are different, the author believed that similar results might be obtained. He therefore treated a mammary abscess, developing during lactation, a poisoned abscess of the forearm, and some minor cases, by free incision and the dry scoop, or the cavity was irrigated with corrosive sublimate, one part to ten thousand of boiled water, by means of Lister's modification of Barker's flushing scoop. Deep and superficial stitches were employed to close the wound, and an antiseptic dressing applied. In each case primary union followed, without a sign of suppuration. The author appends the following summary:

The free incision is needful, not for the drainage of the cavity, but for the drainage of inflamed tissues infiltrated with serum.

The more frequent change of dressings, at least in the early stage, is probably needful to preserve asepsis.

The flushing during the scraping process is probably not required, in view of the free incision and fuller access to all parts of the wound for later antiseptic measures.

The scraped surfaces may be approximated closely because the deeper parts are less infiltrated than the superficial structures, and require less drainage.

Silver sutures are preferable in view of the soaking of the earlier dressings by serous discharge. I have always drawn them tight, and found that they loosened sufficiently where the tissues had drained a little. I have always made considerable pressure on the dressings by means of a firm bandage.

I commend these suggestions, from a limited experience in private practice, to those who have larger opportunities, in the belief that they will tend to shorten convalescence in suitable cases.

Lateral Pharyngotomy for the Removal of the Tonsil for Malignant Disease.

Chavasse, in a lecture on this subject (*Lancet*, London, 1893, vol. i., No. 23), exhibited a patient upon whom he had performed the operation more than a year previously. The patient was thirty-five years of age. He first noticed a small growth at the site of the nail of the right thumb. This resisted treatment, and recurred after scraping. It was thought to be sarcomatous, and the last phalanx of the thumb was removed November 20, 1889. Microscopic examination proved the growth to be a round-cell sarcoma. August 20, 1891, the thumb was removed at the carpo-metacarpal articulation, for recurrence in the stump. The histology of the growth was the same as

before. In January, 1892, the patient noticed that the left tonsil was enlarged and lumpy; he suffered no pain or inconvenience, save a slight hemorrhage. Although syphilis was denied, a course of mercury was administered, during which the growth rapidly increased in size. No other structures were involved. It was resolved to remove the tonsil by an external incision. This was made from the lobule of the ear to the cornu of the hyoid bone. After reaching the pharyngeal wall, a second incision was made from the angle of the mouth to meet the first. In this way the tonsil was readily accessible, and its removal, together with the faucial pillars, by means of scissors was easily accomplished. A drainage-tube was inserted into the pharynx and the wound closed with silkworm-gut sutures. Recovery was prompt, and there has been no recurrence.

The author gives the symptoms in the case detailed, which may be taken as a type, as follows: (1) Pain. This was described as of a lancinating or pulsating character, and was much felt in the ear. Manipulation of the throat increased the pain in the tonsil, but the reflex sensibility of the throat generally was diminished. (2) There was an increased flow of saliva. (3) Dysphagia. (4) Hemorrhage. This was only slight. By those of larger experience it is said to occur in the later stages of the disease, and to come from branches of the external carotid artery. (5) The affected tonsil is at first enlarged, ulceration follows, and the process is somewhat similar to the process seen in cancer of the tongue, the sore being covered with a grayish pulpy slough; its edges are red and its base indurated. (6) Of the adjacent structures, the anterior pillar of the fauces is the first to become involved. The posterior nares and the larynx are said to be rarely affected. (7) The lymphatic glands of the neck, especially about the angle of the jaw, show early signs of infection. (8) Men are the subjects most frequently attacked. This has been attributed to their smoking tobacco. (9) In the published cases the left tonsil seems a little more liable to be affected than the right. In the author's cases, two of the three have been on the left side.

The diagnosis of these cases is frequently difficult. They must be distinguished from—(1) Simple hypertrophy of the tonsil. This occurring on one side only in patients about or beyond middle life, should be regarded with suspicion. (2) Syphilis. This occurs either as a chancre or as a mucous patch. The chancre is usually found in youngish women; it has a regular oval or circular appearance and evenness of base and edges. Early periauricular adenitis is evident. Under appropriate treatment it rapidly heals. The mucous patch is not deeply ulcerated; its base is gray; it is indolent, and adenitis is not marked. (3) Tubercle. There is no induration, no adenitis, and no bleeding, and the surface is granular. (4) Lympho-sarcoma. This is found in young subjects, is of large volume, soft growth, gray slough, and becomes quickly adherent to vessels.

The average duration of life in these cases, if left untouched, is given as 12.4 months. According to Donaldson, it is not more than nine months.

The Employment of Iodoform in Abdominal Operations.

In the *Lancet*, London, 1893, vol. i., No. 23, Mr. Frederick Treves describes what seems to be a new use of iodoform. After quoting from a recent

article by Lister to show that although not germicidal outside of the body, iodoform is, nevertheless, a valuable application in the treatment of wounds, probably on account of a chemical effect upon the product of the bacteria, the author states that for some time he has been in the habit of dusting the exposed tissues in deep wounds freely with this substance.

In the present paper he gives his experience with a like employment of iodoform within the abdomen. The cases reported include nephrectomy for pyonephrosis with post-renal abscess; ovarian tumor; fecal fistula following suppuration and rupture of a dermoid cyst of the ovary; abscess of the liver; cholecystotomy; nephrectomy for hydronephrosis and resection of the intestine. The iodoform is used by liberally dusting the exposed tissues in the depths of the wound, and where packing is required, gauze well dusted with the drug is employed.

The author says: "It would be illogical to argue that the results obtained in the subjoined series of cases were wholly dependent upon the employment of iodoform. They were cases, however, which are apt to be followed by certain dangers and complications, and I am compelled to believe that the uniformly uneventful course observed in each of the cases was not entirely unassociated with the use of this potent drug.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,
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Œsophagoscopy.

Dr. Ludwig Lowe, of Berlin, contributes (*Deut. med. Wochenschr.*, 1893, No. 12) an historic epitome of the subject, and describes and depicts his own appliance for visual examination of the interior of the œsophagus, and describes and depicts the laryngo-œsophageal images observed in the pharyngeal mirror with the œsophagoscope at different levels. The essential features of Dr. Lowe's œsophagoscope are a hood at the top and a hinge in the middle, but they cannot be satisfactorily presented in a short summary, and, therefore, for the present, we must refer our interested readers to the original paper.

Long Sojourn of a Foreign Body in the Nose.

Wiesmann, of Herisau, reports (*Corresp.-bl. f. Schweizer Aerzte*, 1892, H. 3; *Internat. Centralbl. f. Laryngologie, etc.*, July, 1893) a rhinolith composed of a cherry-stone enveloped in chalk which had been removed after a sojourn of sixty years, with intense ozæna as a sequence.

Mr. Alfred Waring reports (*Brit. Med. Journ.*, July 15, 1893) a rhinolith,

also with a cherry-stone nucleus, in the nose of a housemaid, thirty-one years of age. The cherry-stone was one of several introduced at four years of age, and had remained without producing any symptoms whatever until some two years and a half before its removal, and immediately subsequent to an attack of influenza.

Photography of the Larynx.

An illustrated article (*Deutsche med. Wochenschr.*, 1893, No. 12) by Dr. A. Musehold, of Berlin, gives a succinct summary of work by previous observers, and describes and illustrates his own apparatus and pictures.

Death after Operation for Congenital Occlusion of a Nasal Passage.

Victor Lange reports (*Deutsche med. Wochenschr.*, 1892, No. 29) the death of a strongly built man, nineteen years of age, six days after electro-caustic division of an occluding plate in the right nasal passage, osseous above and membranous below. The death was attributed to thrombosis of a sinus.

Alveolar Sarcoma of the Palate.

Dr. T. V. Fitzpatrick, of Cincinnati, reports (*Journ. of Laryngology*, 1893, No. 6) the case, which is illustrated. It occurred in a married woman fifty years of age, and had been growing for fifteen years. It was removed by incision and enucleation, having been encapsuled.

Hemorrhage from the Base of the Tongue.

M. Joal has observed (Soc. Francaise d'Otologie, etc.; *Archives Internationales de Laryngologie, etc.*, 1893, No. 3) three persons presumed to have tuberculosis in consequence of expectorations of blood, and general debility. The lungs were sound. The sputa were free from bacilli. Inspection of the throat with the mirror revealed the source of the hemorrhages in ulcerations and vascular ruptures in the vicinity of an hypertrophied mass of lymphoid tissue at the base of the tongue—the so-called lingual tonsil.

Recurrent Submucous Hemorrhages from the Vocal Bands.

M. Poyet reports (*Ibid.*) three cases: one followed a violent effort; one, a moderate vocal effort during the menstrual period; and the third was in a bleeder. M. Joal remarked that he had had a female singer under his care who for seven years had carried a large vascular dilatation upon the surface of the left vocal band which had not impaired her voice.

Tuberculosis of the Neck in a Man formerly Cured of a Laryngeal Tuberculosis.

Dr. Köbner presented to the Berliner med. Gesellschaft (*Deutsche med. Wochenschr.*, 1893, No. 12) a man with a tuberculous ulcer the size of a silver

dollar in the hairy part of his neck just below the chin. Seven years previously he had been under laryngoscopic treatment for an ulceration on the vocal cords which had healed within some eight months. He was well for four years when a small sore broke out in the sub-mental region, which soon became covered with a crust, and which gradually enlarged to the size of a pfennig, the parts meanwhile having been shaved once a week. Despite the suspension of the use of the razor the ulcer gradually extended to its present size. Dr. Köbner found typical tubercle with giant cells and numerous bacilli on a portion of the border of the ulcer removed for the purpose. Some nine months previously tuberculosis reappeared in the larynx and gradually extended into the pharynx. The neighboring lymph glands were swollen, hard, and painless.

Oil of Naphtha in Infectious Sore-throat.

Dr. G. Dumont, of Lille (*Rev. Internat. de Rhinologie, etc.*, 1893, No. 10), recommends applications of a solution to the contaminated points, as follows: Essence of petroleum 20 grammes, sulphuric ether 5 grammes, finely powdered iodoform 50 centigrammes, and essence of peppermint 20 drops. This is applied every ten minutes during the acute period of the disease, and afterward at intervals of not longer than one hour; and they are continued at longer intervals for several days after the disappearance of the false membranes.

Sub-hyoid Pharyngotomy.

This operation is so seldom required that we call special attention to an instance in which it became necessary for the removal of a retro-pharyngeal morbid growth which turned out to be a fusicellar angeiosarcoma. The entire middle third of the posterior wall of the pharynx of a sailor was occupied by the growth, which impeded both glutition and respiration, and which moved somewhat to make swallowing practicable. Dr. Jakovleff, in whose practice the case occurred (*Chirurgencheskayaletopis*, 1892; *Arch. Internacionales de Rinologia, etc.*, 1893, No. 31), first performed tracheotomy, and endeavored to remove the growth through the mouth six days later. This failed; and so on the tenth day he cut into the pharynx below the hyoid bone, and was able to remove the growth by enucleation.

Polyps of the Nasal Septum.

Polypi of the nasal septum are so rare as to have led many men of large experience to deny their occurrence, but the autopsic-anatomical investigations of Zuckerkandl long ago confirmed the statements of a few observers who reported having encountered such growths in living subjects. Quite recently Dr. Marcel Natier reported (*Arch. Internacionales de Rinologia, etc.*, 1893, No. 31) two cases in detail, both in young women, one in his own practice and the other in that of Dr. v. Lange. Both took origin from the cartilaginous portion of the septum, in one instance on the right side, in the other on the left. Removal of the growth in Dr. Natier's patient was attended with an abundant hemorrhage. Recurrence in place ensued within a few

weeks, and removal was not attended with so much hemorrhage. The point of implantation of the pedicle was cauterized with the electric cautery, and further recurrence seemed to have been thereby prevented.

Parenchymatous Injections in Tonsillitis.

Dr. R. M. Radnitz uses this practice (*Rev. Internat. de Rhinologie, etc.*, 1883, No. 10) in all cases of tonsillitis, whether follicuous, scarlatinous, diphtheroid, or truly diphtheritic. He claims that it always subdues the fever, sometimes completely, so that there is no recurrence. He employs chlorinated water, or carbolic acid solution, 1 per cent., using four syringefuls daily. Furthermore, he washes the orifices of the crypts of the tonsils with a sublimate solution of 0.01 per cent.

DERMATOLOGY.

UNDER THE CHARGE OF

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Diffuse Erythema produced by the Internal Administration of Arsenic.

Nicholson reports a case (*British Journal of Dermatology*, June, 1893) in which three-minim doses of liq. arsenicalis produced a universal erythema. The eruption was most marked on the abdomen, chest, thighs, and upper arms, the skin presenting in these regions a "boiled-lobster" appearance. Upon the fingers there were numerous papules. The conjunctivæ were slightly congested and there was some diarrhœa. Upon suspending the arsenic the eruption quickly disappeared with slight furfuraceous desquamation. Altogether the patient had taken but fifteen minims of the solution.

Palpebral Eczema.

Trousseau (*Annales de Dermatologie et de Syphiligraphie*, 1893, No. 5) regards antiseptics as of great value in the treatment of this often obstinate affection. In order to procure asepsis of the affected region he regards it as necessary to cure as rapidly as possible the eczematous conjunctivitis which always accompanies the affection of the lids, employing for this purpose a solution of sublimate 1 : 10,000, which is later increased to 1 : 2000. This solution is applied not only to the conjunctiva but also to the cutaneous surface, employing at the same time frequent bathing with watery solutions of boric acid. In order to procure repose of the lids the eyes should be kept closed,

and scratching is to be carefully avoided. If the eczema is much irritated the antiseptic solutions are applied during the day, and antiseptic poultices of rice-flour at night. When there is much oozing the poultices should be replaced by powders of bismuth, oxide of zinc, or boric acid. Fissures are to be touched with a three per cent. solution of nitrate of silver. For itching, water containing a small proportion of alcohol, or one-half per cent. solution of carbolic acid in water may be used, and quinine given internally. Ointments are to be employed only in the terminal stage when desquamation appears, beginning with those that are least irritating.

The Cure of Superficial Epithelioma.

At the séance of June 8, 1893, of the Société de Dermatologie et de Syphiligraphie (*La Semaine Médicale*, June 10, 1893), Darier presented five cases of epithelioma of the eyelids which had been cured within a short time by the alternate application of methyl-blue and chromic acid. These applications were made in the following manner: The ulcerated surface was first freed from crusts, and where the border of the ulcer was hard and thick it was lightly touched with the galvano-cautery in order that the chemical agents might the more readily penetrate to the deeper parts. To the surface thus prepared a ten per cent. solution of methyl-blue, in equal parts of alcohol and glycerin, was applied with a brush, and immediately afterward a twenty per cent solution of chromic acid; the blue was then again applied and the ulcer covered with antiseptic cataplasms or sublimated compresses to prevent the formation of crusts. These applications were made four to five times at intervals of two to three days, after which the blue alone was used until the new-formed skin no longer absorbed the color. The treatment of superficial epitheliomata by this method lasted from three weeks to two months.

Nature of Vernix Caseosa.

Wallace Beatty (*Brit. Journ. of Derm.*, July, 1893) examined the skin of the head of a newborn infant whose scalp at birth was covered with vernix caseosa. The infant died a few minutes after birth. Osmic acid stained sections showed that the vernix caseosa is derived from the sebaceous glands, and not, as Unna holds, from the sweat glands.

Ringed Hair.

Crocker reports (*British Journal of Dermatology*, June, 1893) a new case of this rare condition. The patient was a girl about eight years of age, and the affection had been noticed for about two years, the mother dating the change from an attack of contagious ophthalmia following what was believed to be an attack of influenza. The patient's hair was naturally dark, but had been bleached by the application of peroxide of hydrogen and turpentine. In certain lights the alteration was visible to the naked eye, the hair having a mottled appearance, and when examined with a lens alternate bands of light and dark could be seen. Under microscopic examination by transmitted light, the light areas resembled pigment masses, but by reflected light these were seen to be air bubbles which, in places, filled the whole diameter

of the shaft in longitudinal heaps. The infiltration commenced in the medullary portion of the shaft just above the root, and extended along the whole shaft. The whole scalp was affected, but the condition was most marked upon the left side. The hair was not as long as it used to be, and did not seem to grow.

Morvan's Disease.

J. Hogarth Pringle (*Brit. Journ. of Derm.*, July, 1893) discusses this disease, with special reference to the dermatological picture. Morvan gave the characteristics of the disease as being "paresis with analgesia of the superior extremities, at first limited to one side, passing then to the opposite side, ending always in the production of one or more whitlows."

Charcot now considers Morvan's disease to be syringomyelia in a modified form, following the views of Roth. Many observers have been struck with the resemblance between Morvan's disease and anæsthetic leprosy, some authorities, as Zambaco Pasha, stating that Morvan's disease and syringomyelia "are only anæsthetic leprosy modified by civilization, climate, and, above all, by hygienic conditions;" but others, as Thibierge and the author of the paper under consideration, do not think that the identity of the two diseases is proven.

The Treatment of Certain Forms of Acne Rosacea.

Prof. Petrini (*La Roumaine Médicale*, May, 1893) recommends the following application in the treatment of acne rosacea:

℞.—Collodion flexil.	30	
Ichthyol	2	
Resorcin	1	M.

This mixture is painted over the diseased parts, all pustules present having been previously opened for three successive days. After five to six days the applications are repeated as before.

The Passage of Microbes through the Skin.

Wasmuth (*Journ. Amer. Med. Assoc.*, April 22, 1893) describes experiments upon lower animals and man to determine the extent to which different microbes can enter the skin. In man, the pure culture of staphylococcus was rubbed into the arm, and in animals the cocci of erysipelas and carbuncle. If the cultures were merely spread on the skin the results were negative; but if they were rubbed in it was found that the unbroken skin was permeable to these organisms, and that after they were introduced in this way characteristic local and general disturbances followed. The bacilli enter between the sheath and hair-shaft, and not through the openings of the sweat or sebaceous glands.

Deep-seated Trichophytic Affections.

Sabouraud, of the St. Louis Hospital, Paris (*Annales de l'Institut Pasteur*, 1893), has studied these affections, and gives his conclusions as follows: Tinea tonsurans, especially in children in the form known as tinea kerion,

tinea sycosis of the beard, and "agminated peri-folliculitis," are all the same disease, of which the localization is different. The disease is of a mycotic nature, and is due to a special trichophyton. Usually upon man it results from animal contagion, and generally it is the horse from which man contracts it. The lesions are similar upon both man and horse.

Sycosis and Folliculitis.

Ehrmann (*Wiener medizinische Presse*, 1893, Nos. 9 and 10) relying upon the experiments of Garré, Bumm, and Bockhart, accepts unreservedly the bacterial origin of these two diseases, which, although differing somewhat clinically, are etiologically identical, both being due to the invasion of the hair follicles by the staphylococcus pyogenes aureus. In order to overcome the chief obstacle in the way of successful treatment, viz., the difficulty we experience in getting the remedies used deeply into the skin, Ehrmann has employed cataphoresis with good results, using 20–30 per cent solution of ichthyol with a current strength of 20 milliampères. When sinuses exist with sclerosis of the surrounding tissues, it is necessary to lay these open in order that the micro-organisms may all be destroyed. The diseased parts themselves must not only be treated, but all localities from which a reinfection might arise, such as the nasal cavities, the external auditory canal, and care should be taken to avoid the use of unclean combs, brushes, and razors, on all of which the staphylococcus pyogenes has been found.

OBSTETRICS.

UNDER THE CHARGE OF

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A Modification of the Martin-Weigand Method of Delivery of the After-coming Head.

Ostermann (*Berliner klinische Wochenschrift*, 1893, No. 20) describes a modification of the Martin-Weigand method for the delivery of the after-coming head. He recommends applying the hands as in the above-named method, until the brow is at the internal conjugate. At this point he goes well to the patient's side, and, changing hands, passes the left arm along the abdomen of the child, with the first two fingers in its mouth, raises the body with the back toward the mother's abdomen. He regards it as very

important to the protection of the perineum, that the right hand should be placed against this part in such a manner that pressure is made through it against the child's forehead with the ball of the thumb and four fingers. He claims that by the side position of the obstetrician, with the elbow of the inserted hand pointed in an upward direction above the mother's body, he can best control both the child and the perineum and can see clearly the face of the child in the vulva. There is in this manner of lifting the feet no lever action, as in the Prague method. He further says that in the support of the perineum a stroking pressure should be made from behind forward and from the sides toward the centre, until the head comes into the vulva, when a cautious stretching in the opposite direction should be in order. In the application of forceps in these cases, we have the choice of two methods: of guiding the head until the proper time has arrived to apply the instruments; or by drawing the head down until its greatest periphery comes into the diameter, and then taking off the blades and allowing spontaneous delivery; in either case the method of protecting the perineum is the same. The author also thinks his modified position of the child particularly unfavorable for allowing mucus to collect and be drawn into the child's larynx.

Leeches in Eclampsia.

Young (*Lancet*, 1893, p. 1255) reports a case of puerperal eclampsia in which, symptoms of cerebral congestion appearing, he applied leeches to the head with highly satisfactory results. Bromidin was used to control the spasms. Examination of the urine showed albumin in large quantities. At time of writing, patient was in a fair way to recovery. A slight optic neuritis was found by the ophthalmoscope.

Fatal Ante-partum Hemorrhage.

Pierce (*Boston Med. and Surg. Journ.*, 1893, No. 24) reports two fatal cases of ante-partum hemorrhage. In the first no external bleeding could be seen, but a large organized clot was passed after the birth of the child. The placenta showed that it had been separated from the uterus for about a quarter of its surface.

In the second there was a history of post-partum hemorrhage at the last two labors. Considerable external bleeding appeared, and the placenta showed evidence of having been separated from the uterus at its centre for a space of three inches. In both cases a constant, severe, bearing-down pain was almost the first symptom and was continually present. In each instance the child was dead when born.

The Surgical Treatment of Septic Peritonitis.

Worcester (*Boston Medical and Surgical Journal*, 1893, No. 24) considers that the only reasonable treatment for puerperal septic peritonitis is surgical. It is absolutely necessary to find the source of infection, to remove it if possible, and, failing that, to render it less noxious by thoroughly draining the peritoneal cavity. Given any case of septic peritonitis occurring in the puerperium, there is no certainty, except by surgical exploration, that the trouble is not due, for instance, to a perforation of the intestine. He does

not consider medicinal treatment of much account in these cases, as, not knowing the cause producing the peritonitis, the drug given may only increase the infective process. Three very interesting cases are reported. In the first, which terminated fatally on the thirtieth day after delivery, no operation was attempted. The broad ligaments were found riddled with pus sinuses evidently connecting with an abscess next the cæcum. The uterus was honeycombed, and its tissue soaked with ichorous pus. The last two cases reported were, in character, much like the first; in the second an operation was done, but too late, the patient dying. The third, however, had a more happy termination, laparotomy having been done early in the disease. Patient made a good recovery.

Chloral in the Treatment of Eclampsia.

Charpentier (*Nouvelles Archives d' Obstétrique et Gynécologie*, 1893, No. 4) reports the autopsies of thirty-six cases of eclampsia, all treated with chloral or chloroform. Length of narcosis in no case over five to six hours. In all were found lesions of heart, lungs, brain, kidneys, spleen, or liver, but nothing indicative of fatal chloroform poisoning. His method with chloral is to give rectal injections of 4 grm. in 60 grm. mucilage of quince. If this be returned, a second, and, if needed, a third is given until the drug be tolerated, regardless whether the attack continues or not. An interval with no chloral is then allowed for five or six hours. It is then readministered, dose 4 grm., and another interval allowed. He rarely exceeds 12 grm. in eighteen to twenty-four hours, but has used 16 grm. at times. If the attack ceases after the first series of doses, the medication is slowly withdrawn; if not, the doses are approximated. The medication is never to be abruptly withdrawn, but after the injections are dropped, doses by the mouth are continued. Usually labor comes on spontaneously, and if the contractions be vigorous, it is let alone; if not, the forceps is used. Out of 454 cases, the infant mortality was 36.12 per cent. during the labor. His conclusions are:

1. All pregnant women with albuminuria are subject [liable?] to eclampsia. Always examine the urine of a pregnant woman, and if a trace even of albumin be found, put her on *absolute milk* diet. This is the preventive treatment.
2. If patient be strong and vigorous, and if cyanosis is present, bleed 400 to 500 grm.; then administer chloral and put on milk diet.
3. If patient be not strong, bleeding should not be done; chloral should be used.
4. Await spontaneous labor, if possible; if not, use forceps or version.
5. Induced labor to be held in reserve.
6. Reject Cæsarean section and all forcible interference.

The Causes of the Death of One Twin in Double Pregnancies.

Eustace, in an article on the causes leading to the death of one twin in double pregnancies (*Nouvelles Archives d'Obstétrique et de Gynécologie*, 1893, No. 4), writes that it is a matter of common remark that the individual children in twin pregnancies are smaller than in single births, and one twin is often far more developed than the other. Indeed, one may have so much

stronger vital or attractive force than the other as to finally starve its companion, the stronger living at the expense of the weaker. If one twin die shortly before birth, its body is simply macerated; if early in the pregnancy, it undergoes various modifications. A case is recorded in which, at birth, attached to the placenta of the living child was found a sac containing a second placenta, cord, and perfect three months' fœtus. It was quite dry, and flattened out by the pressure of the living child and uterine walls. Again, a twin may undergo arrest of development and conversion into a monstrosity, while its companion remains normal. The death of one in no way injures the other twin, and often seems to increase its growth by the increased supply of nutrition.

Uræmic Convulsions without Eclampsia.

Boudin (*Journal de Médecine de Paris*, 1893, No. 22) narrates an interesting case of uræmia in a woman, a IV-para, at seven months' gestation. Patient had been previously well except for slight swelling of legs and headache. Three days before admission she had lost blood and had had intense dyspnœa which returned at intervals. When seen at La Charité she presented total unconsciousness with tendency to uræmic convulsions. Urine albuminous with accompanying hyaline and epithelial casts. By warm baths, cups, and, later, bleeding, she was restored to consciousness. The secretion of urine was soon established and the bowels freely opened. On the next day labor set in and a dead seven months' fœtus was born. The placenta showed multiple clots. On the following night dyspnœa again set in, but by means of hot baths and milk diet the patient finally recovered.

In this case there was no eclampsia, no œdema, no history of poisoning by alcohol or chloral, and, had chloroform been used, the result had probably been fatal. In convulsions occurring during pregnancy, one must distinguish between eclampsia and uræmia. Regarding the use of pilocarpine he considers that while it promotes sweating, at the same time it causes a bronchial hypersecretion that often proves fatal.

The Colpeurynter as a Means of Uterine Dilatation.

Dührssen (*Centralblatt f. Gynäk.*, No. 23, 1893) considers the subject of artificial dilatation of the cervix to aid delivery. For this purpose he uses a colpeurynter with thin walls, which he inserts, by means of forceps, into the os and fills with water. He has used this method with considerable success in cases of placenta prævia; in cases where from premature rupture of the membranes the labor pains cease, and it has also been of service in several pathological positions and presentations. He reports the summary of twenty-two cases in which this method has been of service.

Rupture of the Uterus complicated by Retained Placenta.

Wasten (*St. Petersburg med. Wochenschrift*, No. 19, 1893) reports the case of a woman with retained placenta. History of no abortions, and eight normal births. Pains during two days; labor lasting longer than usual and a dead fœtus was delivered with forceps. On the following afternoon on

admission to hospital, pelvic measurements were found as follows: Interspinous, 27.5 cm.; iliac crest, 29 cm.; trochanter, 33 cm.; external conjugate, 18¼ cm. Umbilical cord was found hanging from genitals; uterine cavity was empty. Upon examination of the cord, it was found to lead to a placenta lodged in the abdominal cavity. The patient was in a state of general collapse. Temperature, 37.6° C.

Laparotomy having been performed, the placenta was found amid clots resting on the front of external uterine wall. Cord cut and withdrawn *per vaginam;* placenta through abdominal incision. Uterus drawn through the wound; it was well contracted and not bleeding. Supra-vaginal amputation of uterus was performed, the stump being replaced in the abdominal cavity. Patient did well, notwithstanding endometritis arose in the remnant of the cervical canal.

On examination of the uterus after section it was found that rupture had taken place at the placental site; no difference in structure was found by the microscope, however.

In conclusion, the author says: "I have not used the elastic ligature [in uterine amputations], after tying the lateral ligament; I bind the collum uteri in two or three bundles in the same way as a pedicle of a cyst, then I place over the ligature two pincettes and cut the tumor off above them. The stump is not sewed with the peritoneum, but is dropped into the abdominal cavity, and if needed a T-drain is placed through the vagina posteriorly."

Five Laparotomies for Ectopic Pregnancy.

Martin (*Berliner klin. Wochenschrift*, 1893, No. 23) reports five cases of ectopic gestation.

In the first, upon laparotomy the abdomen was found full of clots and blood; the tumor was on the right side, attached all around. Inside the sac a fœtus, ten centimetres long, was found. Extensive adhesions to the small intestine were present. Pedicle of tumor was in the right lateral ligament. Chronic purulent oöphoritis and salpingitis were found. The fœtus was macerated and imbedded in amniotic fluid; cord eleven centimetres long. The case had a fatal termination.

Case 2. A cystic tumor of right ovary with hemorrhage due to a fall. Laparotomy revealed a right tubal pregnancy near the ampulla. Blood was found in the ovisac and in the great cystic cavity of the ovary. Resorption of the fœtus. Rupture of the sac had occurred through the resulting hemorrhage, perhaps due to a fall she had sustained. Patient died suddenly from dyspnœa six hours later.

Case 3. Laparotomy relieved a gravid condition of the left tube at the ampulla. No fœtus could be found. The preparation is about the size of a fist, ragged in surface, with the end nearest the uterine end of the tube attached like a stalk. The tube was normal in thickness; mucous membrane healthy. This ampullar sac seems of about five weeks; it is continuous with the tube; the ovary forms part of the sac wall. Patient was discharged cured in seventeen days.

Case 4. Extra-uterine pregnancy of ovarian type. Operation showed hæmatoma of right ampulla of tube. The right side of the uterus was firmly

adherent to the tumor, as was also the posterior leaf of the broad ligament and the pelvic wall. Left tube converted into a sac attached in the depths of the pelvis to the unchanged ovary; this sac contained pus. Left appendage removed. Recovery complete.

Case 5. Gravid condition of the left ampulla of the tube; an extensive swelling occupied the left pelvis adherent to pelvic wall and intestine. The tumor was isolated to a stalk, which was tied. The bed of the swelling, which was lifted from Douglas' cul-de-sac, showed purulent exudate. Preparation shows a mass of vessels and tissue that together form a cyst wall. No recognizable follicle, but much thickened tube and hypertrophied sac wall. In the ampulla is a hæmatoma the size of a cherry. The fimbriated end opens on the concave side; the inner surface of the mouth of the sac is open. The patient recovered after several collapses.

The Presence of Sugar in the Urine of Pregnant and Nursing Women.

Berberoff (*Vratch*, 1893, No. 16), after a careful investigation of the urine of women in the pregnant and puerperal states, has given the following interesting results of his experiments: The urine in all cases was drawn by a catheter, the specific gravity taken, and all albumin eliminated. Sugar was tested for by the tests of Trommer, Nylander, and Rubne, and when all three tests proved the presence of sugar it was considered positive. The urine of 45 women was examined, and of these 9 were pregnant, 25 confined, and 12 nursing.

The results were as follows:

1. During the last month of pregnancy no sugar was found.

2. Of the 25 parturients, 10 gave a positive result; 3 a trace; 12 negative. Sugar was present from the third to the fifth day.

3. The result in the cases of the 12 nursing patients was negative.

4. The character of the sugar was demonstrated, 1st, by elimination—*i. e.*, urine which gave positive result with tests of Trommer, Nylander, and Rubne, gave negative results with the fermentation test. 2d, by transformation—*i. e.*, transforming lactose into galactose, which then gave positive results with fermentation.

Symphysiotomy.

Zweifel (*Centralblatt für Gynäk.*, 1893, No. 22) gives the following report on the results of symphysiotomy: The later statistics of Morisani give, in 55 operations, 2 maternal deaths and 3 dead children. In his own experience in the Leipzig Klinik, he had a total of 14 symphysiotomies, 12 reported by himself, 2 by König and Abel. The maternal results were all favorable. Of the children, one died from asphyxia and one from pneumonia two days after birth. The forceps was applied ten times, but always when the head was low in the pelvis. After section of the skin a finger was always placed in the pre-vesical region, behind the symphysis, in order to protect the bladder and cover the knife. After complete section, the joint separated ½ cm.; after cutting the ligamentum arcuatum there followed widening of the space a finger's breath. Any hemorrhage encountered was best controlled

by tampons of iodoform gauze. In some cases with narrow pelves the joint widened 6.5 to 7.5 cm. during the birth of the head. There was bony reunion of the joint in his last eleven cases. He regards it as unessential that an assistant make strong pressure on the trochanters. The pubic joint can be brought together by placing the patient on her left side, the legs being straightened. After cleaning the wound, he always places a drain in the lower end. In the course of three cases in which silver wire was used in suturing, incontinence of urine appeared, from an irritation of the bladder from the suture. Catgut had no such results. He finds a small increase of the transverse pelvic diameter in those recovered after symphysiotomy. Those cases with frequent attacks of fever were unfavorable, but only three had distinctly bad puerperal periods. The lacerations of the soft parts were usually severe. Of such he had four cases, of which three were primiparæ. Useless spreading of the pubic joint is best controlled by spontaneous birth. Where high temperature does not make its appearance symphysiotomy generally has a favorable termination.

Symphysiotomy from an Anatomical Standpoint.

Döderlein (*Centralblatt für Gynakologie*, 1893, No. 22), after an anatomical investigation of symphysiotomy, reports that the sacro-iliac joint is not an immovable articulation; it permits great movement without wounding. Separation of this joint amounting to more than six cm. is apt to be followed by rupture of the sacro-iliac ligaments, more on the right side than on the left. Without infection, wounds of this joint heal easily and completely. He finds after symphysiotomy an asymmetrical increase of width in the pelvis caused by the right ilium giving way more than the left. After examination of a number of cases, he finds that for each cm. of spreading of the pubes after section there is an increase of about 8 cm. Where the pubic joint shows a separation of 6 cm. there is a total increase of space of about 50 cm. = 150 per cent. over the pelvis before operation; this increase of space extends through the entire pelvis.

Olhausen (*ibid.*) gives his experience in two cases of symphysiotomy. In the first, a woman with highly contracted pelvis, died in eclamptic coma twenty-four hours afterward. The child was delivered by forceps. In this case he endeavored to use silkworm gut for suturing, but a layer of bone over the pubic joint prevented. In the second case great difficulty was experienced in cutting through the symphysis and in delivering the head. In this case silver wire was used to unite the pubic joint; the same difficulty was experienced as in the former case. In both operations he had the greatest anxiety lest the soft parts should be entirely torn apart. Incontinence of urine followed, although the urethra was intact. The writer concludes, after these two operations and some investigations on the cadaver, that not more than two centimetres separation of the pubic joint follows the simple dividing of the articulation itself; while by section of the ligamentum arcuatum inferius the joint will separate to the extent of 5 to 6 cm.

Koffer (*ibid.*) cites one case of symphysiotomy in which the articulation healed after three weeks. He exhibited an apparatus for holding the joint together after the operation has been performed. He does not consider the

holding of the trochanters by an assistant necessary. In his fatal case there was a phlegmon of the pelvic tissues present; but section showed that except that the pubic joint was somewhat more movable than before, in all other respects was it intact.

LEOPOLD (*ibid.*), after four cases of symphysiotomy, concludes that it is not an operation for general use. It should only be done when the conjugata vera is 8 cm.; for when a large diameter exists spontaneous birth can in time take place. Version should also be tried. The membranes should be kept intact as long as possible. In primiparæ symphysiotomy should very seldom be undertaken.

CHROBAK (*ibid.*) regards the wounds of the soft parts as more dangerous after symphysiotomy than the injury to the symphysis. Where sewing of the joint was necessary he has used, in his later cases, steel pins overlapped with thread. He has found fever often present, and has lost one case by it.

PROLONGED DELIVERY.

TOUVENAINT (*Centralblatt für Gyn.*, 1893, No. 22) reports the case of an embryotomy done after version, in which parts of the fœtus were removed during three days, the head being left in the uterus. After the patient had resumed her occupation, a discharge persisted, and upon consulting another physician it was found that a utero-vesical fistula existed. It was also found that the skeleton of the entire fœtal head still remained in the uterus. After much difficulty dilatation was completed by the use of laminaria, and the fœtal bones extracted with forceps. The woman finally recovered.

PÆDIATRICS.

UNDER THE CHARGE OF

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ASSISTED BY

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THE PERIOD OF CONTAGIOUSNESS OF MUMPS.

RENDU (Société Médicale des Hôpitaux, séance of February 10th, *Revue mensuelle des Maladies de l'Enfance*, March, 1893, p. 124) reports two cases coming under his observation which throw some light upon this question. In one case an adult had contracted the disease after visiting a relative in whom it did not become manifest until a day after the visit. The second patient, a child of ten years, had also become infected from a person in whom the disease was still latent. These facts show that the contagion of mumps manifests itself at the end of the period of incubation, and that transmission

occurs through the expired air. The maximum of virulence of the germ appears to be in the first forty hours of invasion, but this does not assure the absence of virulence during the following days. According to the present practice of quarantine in this disease, school-children are not permitted to return to school for three weeks after their cure, which entails a month of loss for an illness of eight days' duration, while immunity to other pupils is not thereby assured, and the diffusion of the epidemic is not suppressed. At the time that the disease declares itself, it can be presumed that in the preceding forty-eight hours the child has succeeded in infecting his neighbors. On the other hand, it is more than probable that after four or five days of the disease, and especially after the disappearance of the swelling, the contagion no longer exists. It therefore seems to the author that this quarantine of three weeks can be properly shortened, since it does not prevent the diffusion of the disease, which is accomplished largely at a time when the diagnosis is impossible. He believes that measles comes properly within the same category.

ARTERIAL OBSTRUCTION IN THE COURSE OF TYPHOID FEVER IN A CHILD.

SALLÈS (*Lyon Médical*, 1893, No. 3) reports the case of a child of eleven years, who, on the eighteenth day of a typhoid fever, was suddenly seized with severe pain in the upper inner part of the right thigh, which showed neither œdema, deformity, nor inguinal adenitis. The temperature of the limb was sensibly inferior to that of the corresponding member. No pulsation was detected in the femoral, the popliteal, the posterior tibial, or the dorsalis pedis arteries. No sensation of a hard cord was felt in any accessible portion of the femoral. On succeeding days the member became colder and cyanotic, while blueness and violaceous marblings appeared upon the dorsum of the foot. The pain persisted, and the arterial pulsations were completely suppressed. The limb was uniformly swollen, but presented no œdema. Gangrene, which seemed inevitable, did not, however, supervene. Little by little the warmth returned, pain subsided, and the parts returned to a natural condition. During this time the temperature followed the normal course, and took a regular descending curve. Two months after the beginning of the complication pulsation reappeared in the femoral artery. The author rejects the idea of embolism, the heart not having been affected at any time in the disease, and, with less obvious reason, disposes of the question of thrombosis. He attributes the phenomenon to a primitive arteritis occasioned by the bacillus of Eberth or other micro-organisms.

TREATMENT OF PULMONARY TUBERCULOSIS BY GUAIACOL INJECTIONS.

LAPLANCHE, in a Paris thesis of the present year, describes this method of treatment of a number of children suffering from pulmonary tuberculosis of the second and third degree. The results were in general satisfactory, and serve to confirm those obtained by various observers with both guaiacol and creasote, which latter contains 90 per cent. of guaiacol. The solution employed was composed as follows: Guaiacol, 0.05 gm.; iodoform, 0.01 gm., to oil of sweet almond, sterilized, 1 c.c. The hypodermic injections were made with a Roux syringe containing 5 cubic centimetres, all the parts of which

had been carefully sterilized. The region of injection, usually the buttock as being the most convenient and the least painful, received first a cleansing with soap and then with a solution of bichloride, 1 : 1000. The needle was plunged in deeply, and the injection made very slowly; after each injection a prolonged massage of the part was practised to favor the absorption of the liquid. Injections were made daily; commencing with 10 to 20 centigrammes, a dose of 1 gramme daily was reached.

Under these conditions, the change in the general condition was rapid and noticeable with all the patients. From the first week of treatment the pallor of the face disappeared; from being sad, taciturn, somnolent, indifferent to surroundings, the child resumed his happy disposition. The night and day sweats ceased in most of the cases; digestion became more easy; drowsiness after eating disappeared, and sleep became more regular and refreshing. Fever diminished little by little till it completely ceased. Expectoration became less difficult, cough lighter, oppression disappeared, and a progressive increase in weight became manifest.

Of forty-nine patients, in two cases only was this improvement not produced by the guaiacol treatment. Coincidently with the increase of weight the bacilli diminished notably, but did not completely disappear.

Treatment of Myxœdema in Children by Extract of the Thyroid Gland.

Rehn, of Frankfort ("Transactions of the Twelfth German Congress of Internal Medicine," *La Médecine Moderne*, 1893, No. 33, p. 425), reports three cases of typical myxœdema in children, in none of whom could the least trace of a thyroid gland be found. In one case the author's brother, taking advantage of an operation for goitre which he had just finished, implanted in the thyroid region a portion of normal thyroid tissue. In the course of the operation he was able to assure himself of the absence of the slightest trace of the gland. The other two children received by mouth an extract of the thyroid gland of the sheep; these glands were carefully bruised with glycerin and water. For several months these children took twice daily ten to fifteen drops of this extract, and up to the time of reporting had taken two and two-thirds glands. Within the given dose no unfavorable effects were observed. Under this treatment the author saw the myxœdematous infiltration disappear; the children became active again; their hands became warm, appetite improved, weight decreased; the skin became smooth and resumed a normal coloring; the expression of hebetude disappeared, perspiration reappeared, and the stools became more regular. Growth was apparent, and during the treatment of two months these children grew three centimetres.

The child in whom the morsel of thyroid was engrafted presented also a like amelioration with the gradual absorption of the mass.

Hoffmann, of Leipzig, reported a similar result in a case in which the extract was used.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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The Etiology of Purulent Meningitis.

The investigations of A. Fraenkel, Foà and Uffreduzzi, Weichselbaum, Netter, and others have shown the unmistakable and very frequent etiological relationship of the diplococcus pneumoniæ to purulent leptomeningitis. In about 60 per cent. of the cases this germ has been found as the only pathogenic micro-organism present in the exudate, the streptococcus pyogenes and the diplococcus intracellularis meningitidis of Weichselbaum being the species next in frequency in the disease.

The point of entry of these germs into the cranium has excited no little speculation, as in the majority of the cases the meningitis appeared to originate independently of any other suppurative lesion; in a few, otitis media was the evident source of the infection. Latterly Weichselbaum has announced his belief that the source of infection in many of these cases lies in the nasal cavity and its adjoining sinuses, and substantiates this opinion by the report of a number of cases where an inflamed nasal mucous membrane contained the same micro-organisms as those found in the associated meningitis.

Another case of this nature has recently been reported by Zörkandörfer, from Prof. Chiari's Pathological Institute in Prague (*Präger medicinische Wochenschrift*, 1893, No. 18, p. 211). The clinical history presents only the ordinary symptoms of an acute purulent leptomeningitis. At the autopsy, cultures made from the inflamed meninges and from a suppurative inflammation of the mucous membrane of the sphenoidal sinus and upper portion of the pharynx proved the presence in both of the diplococcus pneumoniæ, which was also found in the blood of many of the internal organs. Its virulence was shown by animal inoculations.

The author, consequently, regards the meningitis in this case as a direct extension of the suppurative process from the nasal cavity, and announces it as his opinion that in many cases of so-called idiopathic meningitis a similar avenue of infection might be discovered.

Paget's Disease of the Nipple.

In 1874 Sir James Paget described a peculiar condition of the breast characterized by superficial excoriation beginning at the nipple and gradually invading the surrounding skin, resistant to all treatment, and usually associated with a carcinomatous mass in the other breast. The exact nature and cause of this malady has been the subject of much speculation and investigation, some advocating the view that it is nothing more than an unusual form of epithelioma, others accepting Darier's theory that it is a parasitic disease

caused by a micro-organism of the psorospermiac type, Darier having observed structures resembling psorospermiæ in cases of the disease.

A pronounced case has recently been described by SCHULTEN (*Nordiskt medicinskt Arkiv*, 1893, XXV., Häft 2), Professor of Surgery at the University of Helsingfors. A woman, sixty-nine years old, had for fifteen years suffered from a superficial moist excoriation of the right nipple and breast gradually spreading until two or three square feet of the skin of the right side were involved. A tumor removed eight years ago from the same breast showed the structure of ordinary glandular carcinoma. The axillary glands were not affected. Histological examination of the ulcerated tissue showed decided proliferation of the epithelial elements of the skin, but no penetration of the subjacent tissue, and many of the parasitic (?) forms described by Darier both in and between the cells. Psorospermiæ were also found in the deeper cancer.

Schulten considers the clinical picture presented by Paget's disease to be quite different from that of ordinary epithelioma, because of its softer consistence, its lesser tendency to ulceration, and the non-invasion of the subjacent tissue, though he admits that the microscopical structure closely resembles that of epithelioma. The presence of the so-called psorospermiæ is not conclusive, as they have been found in both conditions. He believes, therefore, that Paget's disease, though not identical with the ordinary epithelioma of the skin, is closely allied to that affection, and cites the varieties of tuberculosis of the skin in illustration.

CHOLECYSTITIS COMPLICATING TYPHOID FEVER.

CAREFUL study of a case of typhoid fever by PROF. CHIARI (*Präger medicinische Wochenschrift*, 1893, No. 22, p. 261) has added another to the long list of complications of that disease which have been shown to be directly caused by the bacillus of Eberth.

A boy, twelve years of age, died of what appeared to be an ordinary case of typhoid fever, complicated at the last by hypostatic pneumonia. At the autopsy, besides the usual lesions, a severe inflammation of the gall-bladder and surrounding peritoneum was discovered. In places the mucous membrane and portions of the wall of the gall-bladder were necrotic, and pus was mixed with the contained bile. The gall-ducts and duodenum appeared to be normal. The presence of the typhoid bacillus in the pus and in the inflamed wall of the gall-bladder was proven by cultures.

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